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DE LA

SOCIÉTÉ ROYALE ENTOMOLOGIQUE

D'ÉGYPTE

DEUXIÈME VOLUME

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TABLE DES MATIÈRES

ADDENDA and CORRIGENDA

to

A Monograph of Egyptian Diptera Part I, Fam : Syrphidae, by H.C. Efflatoun

(published in Mém. Soc. Entom. Egypte, Vol. II, fasc. 1)

Page 11 — Under «General Characters....» read «(Pl. 1, figs 1 and 2)».

17 Line 5, for «2 (29)» read «2 (27)».

31 Line 13, for «Ver.» read «Ges.».

[illegible] — Line 15, for «Sanders» read «Saunders».

[illegible] Delete lines 19 and 20.

[illegible] In «Table of Egyptian species» transpose words : «2 (1) Yellow bands on sides.... upper margin» and «1 (2) Yellow bands absent.... hind margins».

[illegible] Line 20, for «(Pl. IV, figs. 2, 3)» read «(Pl. I, fig. 9 and Pl. IV, fig. 2, 3)».

[illegible] Line 25, for «1782» read «1776».

[illegible] Line 26, for «*vorax* Fourcr» read «? *vorax* Geoffr., apud Fourcr».

[illegible] Line 10, for «more» read «less».

[illegible] Line 5, for «(*Musca*)» read «(*Musca canabina*)».

[illegible] Line 11, for «(1746)» read «(1764)».

[illegible] - Delete lines 32, 33 and 34.

[illegible] Line 31, for «(Pl. V, fig. 2)» read (Pl. I, fig. 10, Pl. II, fig. 2 and Pl. V, fig. 2)».

[illegible] - Line 18, for «(Pl. V, fig. 1)» read «(Pl. I, fig. 13, Pl. II, fig. 1 and Pl. V, fig. 1)».

[illegible] - Under «Synonymy» for «Rob.-Desw.» read «Rob-Desv.».

[illegible] Line 20, for «3 **amœnus** Lw.» read «2 **amœnus** Lw.».

[illegible] Line 23, for «Pl. IV» read «Pl. VI».

[illegible] Line 30, for «Pl. IV» read «Pl. VI».

[illegible] Line 30, for «fig. 3 and 10» read «figs. 3, 10 and 11».

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SOCIÉTÉ ENTOMOLOGIQUE D'ÉGYPTE

FONDÉE LE 1er AOUT 1907

Fatti non foste a viver come bruti,
Ma per seguir virtude e conoscenza.
DANTE.

SOUS LE HAUT PATRONAGE DE SA MAJESTÉ LE ROI FOUAD 1er

2me VOLUME — 1er FASCICULE.

ANNÉE 1922.

A MONOGRAPH OF EGYPTIAN DIPTERA

(Part I. Fam. SYRPHIDAE)

By H. C. EFFLATOUN,
Lecturer in Biology, School of Medecine, Cairo.

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Introductory Note

by

EDWARD HINDLE,

Professor of Biology, School of Medicine, CAIRO.

The study of the Egyptian fauna has long attracted the attention of zoologists in most European countries as evidenced by the number of expeditions, both private and otherwise, for the purpose of studying the animals occurring in the Nile Valley. The results of these expeditions, however, give a very inadequate idea of all except a few isolated groups of animals, as it is impossible for a visitor to a country to obtain anything like the same insight into its natural history, as that obtained by resident observers. The number and occurrence of animals varies, not only with each season, but also in different years, and apart from this a visitor does not possess the same degree of intercourse with the natives and other advantages possessed by the occupants of the country.

Until comparatively recently the fauna of Egypt has rarely been studied by any resident naturalists and therefore it is not surprising that our knowledge of most groups of animals, and especially invertebrates, is still very incomplete.

An additional cause for the lack of information is the absence of any continuity in the studies of the fauna, and in particular the absence of an adequate Natural History Museum for the reception of specimens. Through the untiring efforts of Major S. S. Flower, Director of the Zoological Survey of Egypt, a start has been made in this direction, but the building provided is inadequate for the reception of even the vertebrate fauna of Egypt. In addition the Entomological Section of the Ministry of Agriculture, under the direction of Dr. L. Gough, has formed the nucleus of a collection of the insects of the country, and the Sultanic Agricultural Society a collection of those of economic importance.

Apart from these three institutions, no recent attempt has been made to remedy this defect in the intellectual development of Egypt

and as a result the inhabitants, both Egyptian and non-Egyptian, have very little knowledge of the native fauna and in consequence practically no interest in it. In this respect it is well to recall that when the Egyptian School of Medicine was formed at Abou Zabel in the reign of Mohamed Ali, special attention was paid to the formation of a Natural History Museum, as the importance of this branch of education was fully recognised by its illustrious founder (1). It is sad to have to record the failure of this pioneer effort to build up a museum, as the very fine collections that were got together by a number of enthusiastic naturalists have either been dispersed or disappeared.

The majority of the collections made in Egypt, however, have been taken back to Europe and are scattered throughout the various public and private museums of England, France, Denmark, Germany, etc., and with the exception of entomology, the only representative private collection in this country is that of Dr. Walter Innes Bey. Moreover the literature on the subject is equally scattered and it is extremely difficult to obtain information about most groups of Egyptian animals.

With the idea of placing the Zoology of the Nile Valley on a more satisfactory basis the late Dr. J. Anderson commenced his great work on the Zoology of Egypt and through his efforts the four well known volumes were published by the Egyptian Government, dealing respectively, with the mammals, reptiles and batrachians, and fishes. It is to be regretted that his death interrupted the continuation of this work, which might have formed the basis of a comprehensive work on the Zoology of Egypt comparable with the "Fauna of British India."

In order to help in the development of a fuller knowledge of the fauna of this country it is hoped to publish a series of monographs each dealing with some particular group of animals. In this way all information concerning the native fauna will gradually be collected in a form easily accessible to scientific workers and others interested in the Egyptian Fauna.

The present volume by H. C. Efflatoun, represents the first part of a monograph on Egyptian Diptera which it is intended to issue by installments, each dealing with one or more families. When complete the work will contain descriptions and plates illustrating all known Egyptian species. The advantages possessed by a resident naturalist are well exemplified in the present volume, for in one family, Efflatoun is able to record the presence of ten

(1). *Vide* CLOT BEY, (1840), Aperçu Générale sur l'Egypte. Paris. Fortin Masson & Cie.

species new to Egypt, as well as to correct certain errors in the literature concerning the previously known forms.

In conclusion some reference should be made to what is meant by the term «Egyptian" in this work, as in the past species have been vaguely recorded as coming from Egypt without any clear idea of the geographical boundaries of the country. It is very difficult to adopt the present political boundaries for they are liable to be changed and, moreover, they include at least four distinct faunas. We have, therefore, adopted Storey's (1) suggestion of restricting the term Egyptian to species coming from a more circumscribed area including the Nile Valley from Assouan to the Mediterranean, bounded on the East by the Suez Canal and a line running South from about Suez, and on the West by a line running South from Mersa Matruh, so as to include the oases of Dakhla and Siwa. Practically all the species described in this volume occur in the Nile Valley itself, and in those few instances where they occur outside this area, special attention will be drawn to them, in order to prevent their being loosely classified as "Egyptian."

(1). G. STOREY: The Identification of the Orthoptera figured by Savigny, and other notes on Egyptian Orthoptera. Bull. Soc. Ent. Egypte, 1918, Fasc. 3 (1919).

PREFACE.

The present volume is the first part of a Monograph of the Egyptian Diptera, which it is my intention to issue in separate parts, as they are completed. Each part will deal with one or more families and will be complete in itself, and therefore there is no necessity to adhere to any specific order of issue. The better known groups are being completed first, in order to leave time to obtain a fuller knowledge of the more obscure members of the Order.

Such a large work is perhaps rather beyond the capacity of a single individual and the writer would hardly have attempted such an ambitious project without the promise of help from many of the leading Dipterologists such as Professor Dr. M. Bezzi, Dr. J. Villeneuve, Mr. Tonnoir, Mr. Pierre and Mr. Collin.

I should like to express my especial indebtedness to Prof. E. Hindle for much helpful advice and criticism and for many valuable suggestions. I am very much indebted to Prof. Dr. Bezzi for his help in the identification of the members of the family under consideration in the present volume and also for much valuable information My thanks are also due to Mr. T. W. Kirkpatrick of the Cotton Research Board who suggested several improvements in the key to the genera and Prof. Dr. A. Mochi and Mrs. Mochi for much assistance in the literature.

H. C. E.

INTRODUCTION.

The first volume of a Monograph of the Egyptian Diptera is hardly the place for a discussion of a complete classification of the Order, which at present would necessarily be nothing more than a resumé of the opinions of previous writers, whereas when the Egyptian Diptera have been more extensively studied it is hoped that more light will be thrown on this subject, which, so far is in a very unsatisfactory condition. Further it is my opinion that no final phylogenetic classification can be arrived at in this, or any other order, until a thorough survey has been made of the fauna of Australasia, such as has been done by Meyrick in Lepidoptera, and is now being accomplished by Tonnoir, who is working on the New Zealand Psychodidae, which are undoubtedly one of the most primitive families of Diptera.

In my descriptions I have, as a rule, adopted the system followed by Verrall; in addition, many of the characters given by Bezzi have also been used. The only exception is in the system of Wing Venation, which is that of Comstock*, as I consider this to be the most readily intelligible and the least artificial, being applicable to all orders of insects. The table of the Sub-Families and Genera have been adopted from those given by Verrall (British Flies, Vol. VIII. 1901) and Bezzi (Syrphidae of the Ethiopian Region, 1915). I have included in these tables the sub-families and genera which so far have been recorded from North Africa, as it is very likely that some of them may eventually be found in Egypt, and also to assist in demonstrating the characters of those already recorded from this country.

H. C. E.

*J.H. Comstock: The Wings of Insects, Ithaca, New York, 1918.

CYCLORRHAPHA

ASCHIZA

SYRPHOIDEA

Syrphidae

GENERAL CHARACTERS OF THE FAMILY.

Small to rather large flies which do not possess a frontal suture bladder and without any distinct chaetotaxy. Head as broad as the thorax or a little broader, sometimes elongate or produced in the lower part. Frons more or less produced. Face moderately broad, usually more or less pubescent and clothed with dust, but never bristly, and sometimes quite bare, never with longitudinal furrows or lateral ridges; usually it retreats below the antennae, and then is produced into a central knob, after which it is excavated and again produced to the upper mouth-edge. Occiput usually shallow and bearing dust and pubescence which is continued to the vertex; frequently the occiput is widened about the middle through an inward bend of the eye. Vertex more or less triangular and never bearing any bristles. Ocelli always present. Frons more or less produced, sometimes conspicuously, and never bearing any bristles. Eyes large, bare or pilose, usually touching, or at least approximated in the male, and well separated in the female. Antennae usually more or less drooping, rarely porrected, and approximated at their base, each consisting of three joints, with a dorsal arista on the third joint; the three joints vary in length, but the third is usually the longest; the dorsal arista is usually one-jointed and bare in Egyptian species, although it may be remarkably plumose in other Palaearctic groups and is distinctly three-jointed in the genus *Eumerus;* occasionally this arista may become a terminal style in which case the antennae are conspicuously porrected and elongated (*Cerioides*).

Thorax comparatively large and robust, of normal shape, usually dark coloured with three paler, more or less conspicuous

longitudinal lines. It very often bears a distinct soft pubescence which may either be very slight and inconspicuous, or quite long, close and dense, but which hardly ever bears any bristles or bristly hairs. Scuttellum usually resembling the thorax in colour and pubescence and sometimes bearing bristly hairs on its margin which provide important specific characters.

Abdomen varying very much in shape and colour and composed of five or six visible segments and never bearing any bristly hairs. Hypopygium nearly always asymmetrical and usually not prominent; the abdomen is generally thinly pilose or bare, but sometimes clothed with dense pile or dust or both.

Legs usually moderately strong, but varying very much in shape and pubescence and when bristles are present they are found only on the under surface of the femora. The females of all species have the legs reduced to a very simple form. Sometimes the tibiae and the apices of the tarsal joints bear small apical spurs and occasionally the hind trochanters and femora are armed beneath, especially in the male, and these afford valuable characters for distinguishing species.

Wings comparatively large and with a specialised and distinctive venation. Radius 4+5 never forked; Media 1+2 terminates in Radius 4+5 well before or near the tip; Cell R1 either opened or closed; basal cells large and well distinguished; cell A1 elongated and always closed before the border of the wing. Running right across the radio-median cross-vein, between Radius 4+5 and Media 1 and almost parallel with them, the *vena spuria* or false vein is nearly always present. Although this false vein is characteristic of the family so that its presence certainly secures the admission of any species to this family, its absence does not exclude a species, as it often exists in a very faint or almost imperceptible form. Alulae always distinct and nearly always well developed. Squamulae small or fairly large with a distinctly thickened margin and almost always with delicate fringes which may be composed of simple or compound hairs. Halteres usually moderate in size.

The Syrphidae form one of the largest, most sharply defined, and best known of all the families of Diptera. There are over 2500 species known throughout the world. They occur in all regions from the Tropics to the Poles. They contain among them many of the brightest coloured flies and in the sunlight are remarkably good hoverers and usually very active fliers. The adults are almost always attracted by flowers, especially *Compositæ*, *Umbelliferae* and *Rosaceae*. Some species fly in and out about low herbage and flowers and others may be seen resting on leaves and

even on the earth in the sunlight. A few of them are injurious in the larval stage such as *Eumerus* and *Syritta*, but on the other hand many are very beneficial, being aphidiphagous (*Syrphus*, *Paragus*, *Sphaerophoria*, etc.) ; some live in liquid filth and decaying vegetable matter (*Eristalis*) and others live in the stems of plants and in fungi. The larvae of some species inhabit the nests of the large *Hymenoptera* such as *Vespa* and *Bombus* and they probably act rather as scavengers than as parasites, while others have been found in ants' nests. I do not agree with Verrall's supposition that "*Eumerus* in some way lives in the burrows of small aculeate Hymenoptera," as both *E. amoenus* and *E. vestitus*, the commonest Egyptian species, have been bred from various plants such as onions, potatoes, water-melons, etc. It is probable that Verrall's supposition is derived from the curious habits of the adults which mimic Hymenoptera in their flight and in the case of one or two species can only be caught on the ground or among low lying plants where nests of Hymenoptera may be in close proximity. It is probable however that *Eumerus* found in such localities are about to oviposit and are merely seeking a way to the roots of the plants which their larvae inhabit. It is not unlikely, therefore, that occasionally these insects may enter the burrows of Hymenoptera or any other holes in the ground.

The metamorphoses of most genera have been more or less studied. The larvae are rather various in appearance, and as remarked above, their biology is at the same time very different, in spite of this they have, however, some features in common. Lundbeck says that "the dermis is always tough or more or less leathery, "and it is shagreened from small spinules or hairs which are often "divided into two to four corrugations. There are in all twelve "segments, the head included. Above the mouth opening are two "antennae-like organs; they are, or may be described as, two-jointed, "the last joint bearing two papillæ alongside ; these two papillæ "are not similar, one has at the end a small refractive body, while "the other, the one nearest the mouth, is truncate and generally a "little crenulated at the apical margin. These organs, which are "present and nearly uniform in all cyclorrhaphous larvae, are "generally termed antennæ; Lowne takes them to be the maxillæ. "They have been studied by Wandolleck (Zool. Anz. 1898, 283) and "this author concludes that the whole organ must be taken as an "antenna, and this in spite of his observation, that the upper papilla "with the refractive body gets its nerve from the upper pharyngeal "ganglion, while the other papilla, which is nearer the mouth gets "the nerve from the lower ganglion. De Meijere suggests in his "work on the *Lonchoptera*-larva (Zool. Jahrb. Abtheil. für Syst., "XIV, 1900, 100) after comparing the organ with the antennae and

"maxillary palpi in the larva of *Lonchoptera* that the organ is "really the antenna and maxillary palpus, which are here quite "close standing and fused ; the papilla with the refractive body is "the antenna, the other the maxillary palpus (I think this inter "pretation is quite correct...) The mouth is either armed with "hooks, sometimes bifid, or it has only a pharyngeal skeleton. "Above and at the sides of the body are always some larger spinu-"les or warts; they may be very small and slightly pronounced, (I "think partly dependent on the contraction of the dermis) or they "may be somewhat larger or be developed into longer filaments, as "in the first group of the species of *Syrphus* ; they often bear "branched hairs or spines. They are always arranged in a certain "way; the prothoracal segment has generally some, either more or "less numerous spinules; on the meso—and metathoracal segments "and on the first abdominal segment there is on each a transverse "row of six spinules ; on the other segments they are placed thus "that there are two in the middle on one corrugation and two "towards each side on the following corrugation; when the segments "are less distinctly divided into corrugations, the spinules or warts "may be all placed on one corrugation, but however the two lateral "on each side more posteriorly than the two median ; at the sides "each segment has three spinules, generally one above and two "more downwards, besides, there is generally one more ventrally. "On the last segment they are also present, but the arrangement is "here various. The spinules or warts are, as said, always present "and the longer filaments often present at the sides of the last "segment, belong to them and always answer to them in number "but when these segments are much elongated the arrangement is "effaced; also the threads on the sides of the tail-shaped part in "the larvae of the *Eristalinae*, and the filaments surrounding the "posterior margin of the body in the *Volucella*-larva belong to the "same category. Only in a single case (some *Volucella*-larva) "there are, besides the mentioned spinules or warts, some more. "Many larvae have below pairs of pro-legs armed with spines, "generally six or seven pairs. The larvae are amphipneustic with "generally small anterior spiracles at the hind margin of the first "thoracal segment, and with posterior spiracles on a shorter or "longer posterior process on the last segment, sometimes situated "at the end of a long, tail-shaped part. As the syrphids are "cyclorrhaphous flies the pupa is a barrel-pupa; the larvæ pupates "within the skin of the last larval stage; the skin is contracted "and altered in the well known way and in it lies the real pupa; "the pupa with its enclosing barrel or puparium is in the des-"criptions simply termed the pupa. The pupa still shows the "larval attributes, but the various spinules or filaments, the prolegs

"etc., are generally shorter and less distinct; the posterior spira-"cular process is present as in the larva (but without function). The "prothoracal spiracles of the pupa behave, as mentioned above in "different ways ; in many species (most of the *Syrphinae*) they do "not protrude through the puparium and are thus not visible "externally, but in some of the *Syrphinæ* and in nearly all the "others they protrude as shorter or longer anterior spiracular "tubes, beset with tubercles in various ways. The points through "which they protrude are often (perhaps always) preformed in the "larval skin; these points lie in the first abdominal segment... The "opening of the puparium takes place in a way characteristic for "the family ; two pieces are detached, both belonging to the dorsal "side; the lower piece stretches from the mouth opening over a "part of prothorax, over mesothorax and a part of metathorax, "the upper piece then continues over the rest of metathorax, the "first and second abdominal segments and a part of the third "abdominal segment; this latter piece has near its anterior margin "the anterior spiracular tubes, when such are present. As said it "is only the dorsal part of the segments which are detached. This "mode of opening is quite another than in other *Cyclorrhapha*, "where both dorsal and ventral parts are detached, and it is in "connection with the fact that in the Syrphid pupa the mouth "opening by the contraction has become situated quite downwards "at the lower anterior margin and is not terminal as in most other "cyclorrhaphous pupae. Brauer in his work on the larvae has "given a quite erroneous statement, as he says that the lower side "of the anterior segments by the contraction at the pupation "becomes situated terminally at the anterior end, while it is in "reality quite opposite. De Meijere has thoroughly described and "figured the facts for some Syrphid pupæ (Zool. Jahrb. Abtheil. "für Syst., XIV, 1900, 122, Taf. 7 Fig. 37-39)........ As the "Syrphids have no frontal bladder the opening must be caused in "another way. Becker says (Wien. ent. Zeitg. I, 1882, 51), that it "is caused by a widening of the epistoma (Untergesicht), this is "also so ; when a pupa is taken out of the puparium the epistoma "is somewhat folded in, and it gets first its final more or less "protruding shape by the opening of the puparium. The pupae "are generally found in the same places as the larvae. The deposi-"tion of the eggs takes place where the larvæ live ; the eggs of "*Syrphus* are laid singly between Aphids on leaves...."

The only record I can trace of Syrphidæ being attacked by parasitic hymenoptera in Egypt is *Bassus lætatorius* Fabr., which has been bred from a larva of *Syrphus* sp. by Mr. T.W. Kirkpatrick ; a good many however have been bred in Europe from *Lasiophthicus, Xanthogramma, Eristalis, Syrphus* and other genera.

TABLE OF THE NORTH AFRICAN SUB-FAMILIES.

1	(6)	Antennæ moderate in length and drooping, never placed on a produced frons.	
2	(3)	Radio-median cross-vein placed before the middle of cell M2.	SYRPHINÆ.
3	(2)	Radio-median cross-vein placed after the middle of cell M2.	
4	(5)	Cell R5 remarkably contracted about the middle by a deep loop in Radius 4+5	ERISTALINÆ.
5	(4)	Radius 4+5 not looped, if somewhat looped (*Eumerus*) the turned up part of Media 1+2 is doubly bent.	MILESINÆ.
6	(1)	Antennæ porrected, sometimes placed on a produced frons.	
7	(8)	Radius 4+5 normal, without a loop or adventitious veinlet	CHRYSOTOXINÆ.*
8	(7)	Radius 4+5 with a loop or veinlet almost dividing the cell beneath it (cell R5) into two.	
9	(10)	Arista dorsal; face rounded and pilose; scutellum usually armed or emarginate	MICRODONTINÆ.*
10	(9)	Style terminal; antennæ often placed on a long petiole.	CERIOIDINÆ.

*So far not represented in Egypt.

TABLE OF NORTH AFRICAN GENERA.

1	(40)	Antennæ moderate in length and more or less drooping, never placed on a produced frons.	
2	(29)	Radio-median cross-vein placed before the middle of cell M2.	(SYRPHINÆ).
3	(6)	Face flat or retreating, without a central knob; eyes and face always hairy; thorax always dark and face always black.	
4	(5)	Face with the upper mouth edge conspicuously produced	1 PSILOTA.*
5	(4)	Face without even the upper mouth edge produced; frons of female with grey side dust spots.	2 PIPIZA.*
6	(3)	Face with a central knob or a cone-like snout.	
7	(8)	Face arched and not hollowed beneath the frontal prominence and always partly or wholly yellow (Pl. I, figs. 5, 6, 7)	3 PARAGUS.
8	(7)	Face hollowed below the antennæ and produced again to a central knob or upper mouth edge or to both.	
9	(12)	Entirely dark species without any pale markings except on the legs and beneath the third joint of the antennæ	
10	(11)	Metallic coloured species; no eye-margins; outer top angles of both cells R5 and M2 approximating right angles; eyes always bare.	4 CHRYSOGASTER*

*So far not represented in Egypt.

11	(10)	Species dark but not metallic; distinct eye-margins present; outer top angles of cells R5 and M2 always acute......	5 CHILOSIA.*
12	(9)	Species with pale markings on parts of the head, thorax, scutellum and abdomen.	
13	(14)	Hind femora thickened and spinose beneath (Pl. II, fig. 8)..............	6 SYRITTA. (MILESINÆ).
14	(13)	Hind femora not thickened or spinose.	
15	(26)	Abdomen not conspicuously constricted about the base.	
16	(17)	Face and scutellum entirely æneous or black (sometimes appearing grey or yellowish from superincumbent dust); thorax provided on the sides above the notopleural depression and before the transverse suture with a rather prominent tubercle; cell M2 shorter than cell R5........................	7 MELANOSTOMA.*
17	(16)	Face and scutellum partly or wholly yellowish.	
18	(21)	Thorax with bright yellow side lines and the pleura with yellow markings; abdomen narrow, elongate and with parallel sides.	
19	(20)	Abdomen narrower than the thorax, not flattened, usually longer than the wings; male genitalia very large and orbicular	8 SPHÆROPHORIA.
20	(19)	Abdomen as broad or a little broader than the thorax, flattened, shorter than the wings; male genitalia of moderate size	9 XANTHOGRAMMA.
21	(18)	Thorax without any bright yellow side lines and the pleuræ not yellow spotted.	

*So far not represented in Egypt.

22 (23) Frons inflated (Pl. I, fig. 11)........ 10 LASIOPHTHICUS.

23 (22) Frons normal.

24 (25) Thorax provided in front with a distinct collar of hairs; ocelli at some distance from the vertex............ 11 ASARCINA.*

25 (24) Thorax without a distinct collar of hairs; ocelli placed near the vertex.. 12 SYRPHUS.

26 (15) Abdomen conspicuously constricted about the base, tubular and club-shaped; markings less well defined........ 13 PSEUDODOROS.

27 (2) Radio-median cross-vein placed after the middle of cell M2.

28 (35) Radius 4+5 looped causing cell R5 to be remarkably contracted about the middle .... (ERISTALINÆ)

29 (30) Radius 1 united with Radius 2+3 at the end, (Pl. I, figs. 1, 2)............ 14 ERISTALIS.

30 (29 Radius I separated from Radius 2+3..

31 (32) Hind femora with a distinct tooth-like process beneath, near the apex...... 15 MERODON.*

32 (31) Hind femora not toothed.

33 (34) Eyes hairy .... 16 MYIATROPA.*

34 (33) Eyes bare .... 17 HELOPHILUS.

Subgenera :—

1 (2) Eyes of male almost touching .... MESEMBRIUS.

2 (1) Eyes of male widely separated

*So far not represented in Egypt.

3	(6)	Third joint of antennæ not transverse; abdominal markings (when present) transverse.	
4	(5)	Face moderately produced at the upper mouth-edge	HELOPHILUS and PARHELOPHILUS.
5	(4)	Face very much produced at the upper mouth edge	EURINOMYIA.*
6	(3)	Third joint of antennæ transverse; abdominal markings longitudinal	LIOPS.

35	(28)	Radius 4+5 not looped, if somewhat looped (*Eumerus*) the turned up part of Median 1+2 is doubly bent........	(MILESINÆ).
36	(37)	Face hollowed beneath the antennæ; outer top angle of cell R5 acute......	18 SYRITTA.
37	(36)	Face not hollowed beneath the antennæ, outer top angle of cell R5 a right angle, or obtuse, (fig.14, Pl. I and fig.3, Pl. II)	19 EUMERUS.
38	(1)	Antennæ porrected.	
39	(40)	Radius 4+5 normal, without a loop or veinlet which may almost divide cell R5 into two	(CHRYSOTOXINÆ).* 20 CHRYSOTOXUM.
40	(39)	Radius 4+5 with a loop or veinlet almost dividing the cell beneath (cell R5) into two	
41	(42)	Arista dorsal	(MICRODONTINÆ).* 21 MICRODON.
42	(41)	Style terminal	(CERIOIDINÆ). 22 CERIOIDES.

*So far not represented in Egypt.

SYRPHINÆ

1. PARAGUS LATR.

LATR., Hist. Nat. d. Crust. et d. Ins., XIV. 359. DXXII, (1804) et Dict. d'Hist. Nat. Deterville, XXIV. 194. (1804).

Small thick-set, short flies of more or less dark colour, except parts of the face, scutellum, abdomen and legs.

Head rather flattened, broader than the thorax, face not hollowed below the antennae, but produced into a knob and always mostly or entirely yellow or pale yellow. Eyes pilose with the hairs often running into stripes, always touching in the male and well separated in the female. Antennæ slightly porrected, with the third joint longer than the basal two together, and dorsally bearing a short, bare arista, which is inserted before the middle of the joint.

Thorax rather quadrate in shape and with very simple inconspicuous pubescence. Scutellum with a vestiture similar to that of the thorax, sometimes entirely æneous-black and often pale at the tip, or with the lower half entirely yellow. Abdomen with a simple, very short pubescence, about as wide at the thorax and of about equal width throughout, with a shallow transverse depression on each segment. Legs simple and rather slender. Wings very much like that of the genus *Syrphus* but the turned up portion of M1+2 and the median cross-vein are not parallel to the wing margin, and keep well away from it, and the turned up portion of M1+2 possesses a peculiar undulation ; the radio-median cross-vein is placed well before the middle of cell M2, consequently Verrall states that the peculiar undulation of the turned up portion of M 1+2 may suggest a relationship to the genus *Eumerus*, which is also in some way connected with the small Aculeate Hymenoptera; but the position of the radio-median cross-vein which is

obviously placed before the middle of cell M2, seems to exclude the possibility of any relationship between these genera.

The larvæ undoubtedly feed on Aphides. I have caught *P. tibialis* and its two well known varieties hovering over *Sonchus* in the Mariout District. Mr. F. A. Willcocks has bred the larvæ of *P. ægyptius* on *Aphis gossypii* and *Hyalopterus pruni* on Apricot in Ghezireh.

SYNONYMY.—This genus was established by Latreille in 1804 for *Mulio bicolor* of Fabricius and Verrall states that there has never arisen a doubt about the synonymy or limits of the genus.

TABLE OF EGYPTIAN SPECIES.

1 (2) Face with a black middle lines in both sexes ; scutellum entirely black in both sexes (Pl. I, fig. 6), ... **1 tibialis** FALL.

2 (1) Face entirely whitish-yellow or yellow in both sexes; scutellum with the tip or often the lower half yellow in both sexes (Pl.I, fig.5) . **2 ægyptius** MACQ.

1. P. TIBIALIS **FALL.** (Pl. III, figs. 2, 3, 4).

FALL., Dipt. Suec. Syrph., 60.5, pp. (*Pipiza*) (1817) ; MEIG., System. Beschreib., III. 183.13. (1822); MACQ., Rec. Soc. Sci. Lille, 1828.187.6. (1829) et Suit. à Buff., I. 567.14. (1834) ; ZETT., Ins. Lapp., Dipt., 618.2. (1838) et Dipt. Scand., II. 852.6 (1843) ; SCHUMM., Ubers. d. Arb. u. Verand. d. schles. Ges. f. vaterl. Kultur, 1842.164. (1842); ZETT., Dipt. Scand., VIII. 3188.6. (1849); LW., Verh. zool.-bot. Ver. Wien, VII. 80.30. (1851) et Dipterenf. Südafr., 294. (366) (1860); SCHIN., Verh. zool.-bot. Ver. Wien, VII. 303.8. (1857), Fauna Austr., Dipt., I. 257.1. (1862) et Nov, Reise, Dipt., 339.103. (1868); BONDS., Finl. tvaving. Ins., I. 284.3. (1861); WALK., List Dipt. Brit. Mus., III. 544. (1849) ; MALM., Gœteb. Kongl. Vet. Handl., 70. (1863); WILLIST., Bull. Unit. Stat. Nat. Mus., (31), 19. t. I; f. 8. (1886); NEUHAUS, Dipt. Marchica, 90. 2. (1886); STROBL, Mittheil. Naturwiss. Ver. Steiermark, XXIX. 1892.197. (1893); SNOW, Kansas Univ. Quart., III. 227. (1895); TOWNS., Psyche, VIII. 140. (1897); VERR., Brit. Fl., VIII. 150.1. f.

175-177 (1901); OSBURN, Canad. Entom., XXXVI. 216.4. (1904); ALDR., Catal. N.A. Dipt., 351. (1905); STROBL, Mem. R. Soc. Espan. Hist. Nat., III. 330. (115). (1906); SACK., Verh. zool.-bot. Ges., LVI. 470. (1906); BEZ., Ditt. Eritrei, II. 12. 12., 21. 75. (1908), Dipt. Syriaca et Aegypt., 56. (20). 88. (1909), Syrph. Ethiop. Reg 12. 15.6. (1915) et Syrph. æthiop. Mus. Nat. hungarici, 132 (2) 5.6 (1921) LUNDB., Dipt. Danica, V. 47-49. f. 7.8. (1916).

SYNONYMY:—æneus MEIG., System. Beschreib., III. 1831.11. (1822); MACQ., Suit. à Buff., I. 567.12. (1834); ZETT., Dipt. Scand., II. 854.8. (1843) et VIII. 3188.8 (1894).

femoratus MEIG., System. Beschreib., III. 184.14. (1822); CURT., Brit. Entom., VIII. 593., 2.6. (1836); WALK., List Dipt. Brit. Mus., III. 544. (1849) et Ins. Britann. Dipt., I. 268.4. t. X. f. 3. (1851); ROND., Dipterol. Prodr., II. 191.2. (1857); NEUHAUS, Dipt. Marchica, 9.2. *b.* (1886); STROBL, Wien. Ent. Zeitg., XVIII. 147. 115. (1889).

hæmorrhous MEIG., System. Beschreib., III. 182.00. (1822); ST. FARG. & SERV.. Encycl. Méthod., X. 2.6. (1825); MACQ. Suit. à Buff., I. 567.11. (1834); NEUHAUS, Dipt. Marchica, 90.2 *a* (1886); JONES, Journ. New York Entom. Soc., XV. 90.2. (1907).

obscurus MEIG., System. Beschreib, III. 183.12. (1822); MACQ., Rec. Soc. Sci. Lille, 1828. 187.7. (1829) et Suit. à Buff., I. 567.13. (1834); CURT., Brit. Entom., VIII. 593., 2.4. (1836); WALK., List Dipt. Brit. Mus., III. 544. (1849) et Ins. Britann., Dipt., I. 268.3. (1851); STROBL, Mem. R. Soc. Espan. Hist. Nat., III. 330. (1906).

sigillatus CURT., Brit. Entom., VIII. 593. t. (1836).

geniculatus CURT., Guide, Edit. II. 250.5 (1837).

trianguliferus ZETT., Ins. Lapp., Dipt., 618.3. (1838) et Dipt. Scand., II. 853.7. (1843); BONDS., Finl. tvaving. Ins., 1.284.4. (1861); MALM., Gœteb. Kongl. Vet. Handl., 1863.71. (1863).

nigritus GIMM., Bull. Soc. Imp. Nat. Moscow, XV. 668. (*nigritis*) (1842) et XX. 2., 172.1. (1847).

albipes GIMM., Bull. Soc. Imp. Nat. Moscow, XV. 668. (1842).

dispar SCHUMM., Ubers. d. Arb. u. Verand. d. schles. Ges. f. vaterl. kultur, 1842. 163. (1842).

coadunatus ROND., Nuov. Annal. Sci. Nat. Bol., (2). VIII. 346. (*Sep.* 12). (1847), Dipterol. Prodr., II. 190.1. (1857), et Bull. Soc. Ent. Ital., IX. 60. (1877); SCHIN., Nov. Reise, Dipt., 369.103. (1868).

tarsatus ROND., Dipterol. Prodr., II. 191.3. (1857).

substitutus LW., Œfv. Kongl. Vet. Akad. Forhandl., XIV., 1857.376.6. (1858) et Dipterenf. Südafr., I. 294.1. (1860); BEZ.,

Ditt. Eritrei., II. 21.75. (1908) et Syrph. æthiop. Mus. Nat. hungarici, 132. (2).5. (*tibialis var.*) (1921).

dimidiatus Lw., Berl. Entom. Zeitschr., VII. 308.68. (1863) ; Willist., Bull. Unit. Stat. Nat. Mus., (31), 20. (1886) et Biolog. Centr. Amer., Dipt., III. 5.1. (1891); Towns., Psyche, VIII, (259), 140. 2. et (260)., 147.2, (1897); Aldr., Catal. N.A. Dipt., 351. (1905).

tacchetii Rond., Atti. Soc. Ital. Sci. Nat. Milano, VIII, 140. (1865).

varipes Big., Annal. Soc. Entom. Fr., (5). X. 150. (*Orthonevra*) (1880) et (6). V. 249 (*Orthonevra*) (1885).

auricaudatus Big., Annal. Soc. Entom. Fr., (6). III. 1883. 540. 2. (1884); Willist., Bull. Unit. Stat. Nat. Mus., (31), 301. (1886).

DIAGNOSIS:—Face with a black middle line in both sexes ; scutellum entirely black in both sexes.

DESCRIPTION : — *Male* : Face from light to dark shining yellow with a black middle line which extends from between the antennæ to the upper mouth-edge; this line is rather widened about it's lower part and is produced quite one third of the width of the eye. Pubescence delicate white and equal everywhere except on the middle line. Jowls small with white pubescence which is continued on to the occiput. Vertex shining black, elongate and very pointed in front and possesses inconspicuous blackish pubescence. Eyes touching for a short distance and with short inconspicuous whitish pubescence which has no tendency to run into stripes. Antennæ with the two basal joints black ; the rather long third joint which is usually about three times as long as broad is generally black above and yellow below; arista brown, bare and not quite as long as the third antennal joint.

Thorax aeneous-black, shining, and rather coarsely punctate; it is clothed with fairly abundant and erect whitish pubescence, which is whiter and much longer on the pleurae. Scutellum with a similar pubescence as that of the thorax and without any trace of light colour.

Abdomen shining black, with a punctuation which is coarser on the basal half, but the extreme hind margins of the segments are impunctate and very shining; sometimes it bears orange-red or yellow markings, which colour may extend on to all the segments, except the basal one, such as in the varieties mentioned below. The second segment is longer than the basal, the third longer than the second, the fourth longer than the third, and the fifth is much shorter than any of the four others but is very obvious ; the abdo-

men is clothed with very inconspicuous whitish pubescence, which is much longer on the side margins of the basal segment.

Legs bright orange-yellow with the basal two-thirds of the anterior and posterior femora black; the hind tibiæ usually have a dark ring or blotch just after their middle. The hind femora are slightly thickened about the middle, also the basal joint of the hind tarsi is rather swollen; pubescence pale and inconspicuous but fairly long on the posterior tibiæ.

Wings pellucid with the stigma brownish. Squamulæ and halteres yellow.

Female.—Very similar to the male; face sometimes blackish but usually yellow at the sides and obscure in the middle. Frons as well as the thorax rather shining bluish-black. Scutellum entirely shining æneous-black without any traces of yellow.

Length from 5 to 6 mm.

This species seems to be rather rare in Cairo and its neighbourhood, but fairly common in the Mariout District, where I have obtained a small series in which the two varieties described below outnumbered the type. My records date from February 4th to July 5th. It is known to occur in Africa, throughout Europe and a large portion of North America, as well as in South America.

Var. trianguliferus Zett., a form in which there is a rather large ferruginous spot on the third segment of the abdomen.

Var. hæmorrhous Meig., another form in which the abdomen is bright red except the basal and the upper part of the second segment. I possess some specimens which have only the basal segment of the abdomen black and the other four segments entirely reddish.

These two varieties seem to be quite as common, if not commoner than the type, but up till now I have only obtained them from the Mariout district, at the same time as the type. Lately I have obtained the type as well as the var. *trianguliferus* in the Wadi Hoff and Wadi Rishrash.

2. P. AEGYPTIUS MACQ. (Pl. III, figs. 1, 5, 6).

Macq., Dipt. Exot., Suppl.4., 160.2. (1849); Beck., Mitteil. Zool. Mus. Berl., II. 90.126. (1903); Bez., Ditt. Eritrei, II. 12.1. (1908) et Dipt. Syriaca et Ægypt., 56. (20). 86. (1909).

DIAGNOSIS.—Face entirely whitish-yellow in both sexes, scutellum with the tip and often all the lower half yellow in both sexes.

Very similar in colour, markings and size to *P. tibialis*, but easily distinguished from it by the above characters.

DESCRIPTION:—Male. Face and frons entirely shining whitish-yellow or yellowish-white, even the upper mouth-edge; mouth and proboscis black; pubescence on the face and frons very short, and inconspicuous. Occiput either entirely covered with silvery white hairs, or yellowish-white hairs on the upper part and white below. Vertex elongate, shining æneous-black, with yellow dust; its pubescence is very short, pale yellow and inconspicuous. Eyes meet for a distance which is shorter than the length of the very short frons, and with rather conspicuous white pubescence which has a tendency to run into stripes, and which leaves the front and the back of the eyes (on the upper part) less conspicuously hairy. Antennæ rather long; the third joint is long, narrow and pointed and is about five times as long as wide; the two basal joints are blackish and the third is usually brownish above, but brownish-yellow beneath and sometimes it is uniformly darker; arista inserted well before the middle of the joint and shorter than the third antennal joint.

Thorax varying from deep black to brassy greenish-black or blackish-æneous and always shining, although rather coarsly punctate; it possesses two very faint dull lines on the front of the disc; pubescence on the disc very short, pale and inconspicuous, but with a tuft of much longer, shining white hairs on the meso-pleuræ; scutellum with either its basal half or the basal three-quarters shining æneous-black, but with at least the apex yellow and with short and pale yellow pubescence.

Abdomen varying exceedingly in colour. In some cases entirely black with yellowish-red or reddish isolated spots on the second, third and fourth segments, in others it is yellowish-red or reddish, except the base and the apex obscurely dark, and occasionally the abdomen is entirely reddish except the basal corners; it is rather coarsely punctate, except the extreme hind margins of the segments which are very shining; pubescence entirely pale and inconspicuous, but longer and tufted on the first segment and on the basal corners of the second segment. Hypopygium small, yellowish-brown and apparently free from pubescence.

The two anterior pairs of legs are always entirely yellow or orange-yellow, but the hind legs are variable in pale specimens, being nearly entirely orange, except for a dark brown spot on the femora after the middle, and in darker specimens being orange and black.

Wings pellucid, with the stigma brown or brownish-yellow. Squamulæ yellowish-white. Halteres very pale yellow, with the base dark brown.

Female.—Very similar to the male, except the frons is rather shining black.

Length from 6 to 7 mm.

This species, I think, is the commonest and most widely distributed member of its family in Egypt.

It is equally abundant throughout the whole length of the Nile Valley, from Assuan down to the Mediterranean Coast as well as in the desert and it may be found nearly all the year round.

It is known to occur in Syria, North Africa, and it probably occurs along the Mediterranean Coast to Morocco.

The larvæ feed on Aphids (see Page 22).

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2. SPHÆROPHORIA St.-FARG. & SERV.

St.-Fargeau & Audinet-Serville, Encycl. Method. X. 513 (1825).

SYNONYMY:— *Melithreptus* Lw. Programm. Posen, 27 et Isis, VIII. 577. (1840).

Melitrophus Walk., Ins. Britann., Dipt., III. XXI. (1856).

Fairly long, narrow bodied, small or rather small flies with brilliant yellow markings, which are almost as extensive as the black ground colour. The members of this genus are closely allied and resemble those of the genus *Syrphus*, but they may easily be recognised by the large number of abdominal segments (except in the allied genus *Xanthogramma*), as there are five quite distinct segments in the male, before the very large genitalia and often six or seven are visible in the female before the ovipositor.

The head is of the ordinary *Syrphus* type, except that it is much more protruding below at the mouth, always mainly and conspicuously yellow, and the hollow below the antennae is much less pronounced. Eyes quite bare. Antennae very simple, with a bare, normal and rather short arista.

Thorax blackish with the side margins more or less conspicuously yellow or orange, at least from the humeri to the suture and then on the postalar calli; the pleurae are yellow on all the mesopleurae, pteropleurae, metapleurae, and the upper part of the sternopleurae, as well as the prothorax; scutellum always conspicuously yellow. These characters also show that *Xanthogramma* is the nearest ally.

Abdomen rather long and narrow, (especially in *S.scripta*) with yellow or orange markings, which are somewhat peculiar to the genus, and with remarkably clubbed male genitalia. I agree with Professor Bezzi's opinion that these require special attention and study in the future, as they probably represent more substantial specific differences than the yellow markings on the abdomen, colour of legs etc. which are liable to great local variation and up till now have constituted the most valid differences between many species.

Legs very simple, yellow and without any unusual shape or any very conspicuous pubescence. Wing venation very similar to

that of *Syrphus* although a difference may be detected by a trained eye in the more pronounced undulation of the turned up portion of M 1+2.

This genus shows a distinct connection with our *Xanthogrammá ægyptium*, although in Europe it seems to be well separated by its distinct shape and markings.

Sphærophoria, as a restricted genus, occurs in North Africa, India, Céylon, Australia, Japan, North and South America, Siberia, Greenland, Madeira, Canary Islands, Asia Minor, Java, Sumatra, North America, Marquesas and Tahiti Islands, and throughout Europe.

The metamorphoses of a few species are known. The larva and pupa of *S.scripta*, which were found among Aphids in April and May, have been described by Rœsel (Ins. Belust. II, 1749 Musc. 31 T. VI.). Bouché (Naturg. d. Ins. 1834, 51, T.V. f. 4-6) describes the developmental stages of *S. menthastri* (*taeniata*) and states that the larvæ were found among Aphids on Compositæ. Zettersted (Dipt. Scand., II. 1843, 766) says that he found larvæ and pupæ of *S.scripta* as well as those of *S.menthastri*, the larvæ of the latter feeding on Aphids on *Vicia faba*. Lundbeck (Dipt. Dannica, V. 340. 1916) has also found the larva of *S. scripta* feeding on Aphids and I have myself found the larvæ of *S. flavicauda* feeding on an Aphis on *Centaurea ægyptiaca*.

Lundbeck describes the larva of *S. menthastri* as being "of the "usual shape of a Syrphus larva ; it is corrugated above, the dermis "is finely shagreened and there are very small bristles on the "dorsum and at the sides, arranged quite as in *Syrphus* ; on the "ventral side there are slight transverse swellings ; the posterior "spiracular process is not quite short, black, with a longitudinal "dividing furrow above and below and the apical cleft with the "points a little diverging. The larva is light green with two "whitish longitudinal dorsal stripes. Length from 7 to 10 mm. The "pupa is broad and rounded in front and attenuated behind and "thus drop-like; the spiracular process is as in the larva; it is green "during the first part of the development, later the imago shines "through and the empty puparium is whitish. Length about 7 mm."

The larvæ are aphidiphagous. Verrall states that *S. flavicauda* is in some way associated with the garden Asparagus and that an allied genus *Mesograpta* (*M. polita*, Say) has been proved to eat pollen in the larval stage.

At the period of pupation the larva attaches itself by its posterior extremity to a leaf or stalk.

SYNONYMY:—I agree with what Verrall says as regards the synonymy of this genus, and entirely support his statement that

there is not the slightest reason for changing the name *Sphærophoria*, for which Lœw in 1840 suggested the name *Melithreptus*, a change which has been adopted by Becker. Lœw's reason for changing the name *Sphærophoria* was his impression that two other similarly named genera, *Sphærophora* and *Sphærophorus* were already established. Verrall, however, could not trace any genus *Sphærophora* while *Sphærophorus* was created by Waltl for a beetle, ten years after *Sphærophoria* has been established. Moreover this beetle had already been described a year earlier as *Thorictus*. In addition, the name *Melithreptus* had also been suggested by Vieillot in 1816, for a genus of birds, and consequently Haliday suggested the name *Melitrophus* in Walker's Insecta Britannica, Diptera.

TABLE OF EGYPTIAN SPECIES.

1 (2) Thorax with its side margins continuously yellow ; abdomen very elongate, (Pl. III, figs. 9 and 11) .... **1 scripta** L.

2 (1) Thorax with its side margins yellow only above the suture; abdomen small and moderately long, (Pl. III, figs. 7, 8, 10)........ **2 flavicauda** Zett.

1. S. SCRIPTA L. (Pl. III, figs 9 & 11)

L., Syst. Nat., X. 549.42. (*Musca*) (1758) et Fauna Succ., 449. 1820. (*Musca*) (1761); Roesel, Insect. Belust., II. Musc. f. VI. (——) (1764) ; O.F. Muller., Fauna Ins. Friedrichsd., 82.723. (*Musca*) (1764) et Zool. Dan. Prodr., 172.2013. (*Musca*) (1776); Fabr., Syst. Entom., 772.45. (*Syrphus*) (1775) Spec. Ins., II. 434.62 (*Syrphus*) (1781), Entom. Syst., VI. 308.113. (*Syrphus*) (1794) et Syst. Antl., 252.17. (*Scæva*) (1805); Vill., Entom. Linn., III. 449. 103. (*Musca*) (1789); Gmel., Syst. Nat., V. 2876.54. (*Musca*), (1790); Cederh., Faunæ Ingr. Prodr., 307.965. (*Syrphus*) (1798); Schell., Genres Mouch. Dipt., 52. t.X.f. 2. (*Syrphus*) (1803); Latr., Dict. Hist. Nat. Deterv., XXIV. 195.568. (*Syrphus*) (1804) et Gen. Crust. Ins., IV. 325. (*Syrphus*) (1809); Meig., System. Beschreib., III.324.73. (*Syrphus*) (1822); St. Farg. & Serv., Encycl. Méthod., X. 513. (1825); Macq., Rec. Soc. Sci. Lille, 1828.218.1.t.II.f.3. (1829),

Suit. à Buff., I. 551.1. (1834), in WEBB & BERTH., Hist. Nat. Iles Canar., Entom., Dipt., 109.52. (1838) et Explor. Scient. Alger., Zool., III. 470.174. (1849); BRULLÉ, Expéd. Sci. de Morée, III. 1., 310.672. (1832); ZETT., Ins. Lapp., Dipt., 605.28. (*Scæva*) (1838) et Dipt. Scand., II. 766.1. (1843), VIII. 3157.1. (1849) et XI. 4305.1. (1852); LW. Programm. Posen, 1840.37.1. et *var* 2. t., f. 52. (*Melithreptus*) (1840), Isis 1840. VIII 578.1. et *var.* 2. t., f. 52 (*Melithreptus*) (1840), Verh. zool.-bot. Ver. Wien, VII. 80.35. (*Melithreptus*) (1857) et Wien. Entom. Monatschr., II. 108.11. (*Melithreptus*) (1858); WALK., List Dipt. Brit. Mus., III. 592. (*Syrphus*) (1849), et Ins. Britann., Dipt., I. 299.1. (*Melithreptus*) (1851); ROND., Dipterol. Prodr., II. 112.1. (1857) et Bull. Soc. Ent. Ital., IX. 61. (1877); SCHIN., Verh. zool.-bot. Ver. Wien, VII. 369.1. (*Melithreptus*) (1857) et Fauna Austr., Dipt., I. 316.3. (*Melithreptus*) (1862) ; CURT., Farm. Ins., 82. (1860); BONDS., Finnl. tvaving. Ins., I. 257.1. (1861); MALM., Gœteb. Kongl. Vet. Handl., 1863.47, (1863); v. d. WULP, Tijdschr. v. Entom., XXVI. 8.43 (*Melithreptus*) (1883); KOW., Wien. Entom. Zeitg., IV 134. (*Melithreptus*) (1885); WILLIST., Bull. Unit. Stat. Nat. Mus., (31)., 107. (1886); NEUHAUS, Dipt. Marchica, 103.1. (*Melithreptus*) (1886); PIERRE, Bull. Soc. Saone, IV. 40. (*Melithreptus*) (1887); STROBL, Mittheil. Naturwiss. Ver. Steiermark, XXIX. 1892.162. (*Melithreptus*) (1893); GIRSCHN., Illustr. Wochenschr. f. Entom., II. 568. t. III. f. 16. (*Melithreptus*), (1897); VERR., Brit. Fl., VIII. 428. I. f. 311-314. (1801); MEIJ., Zool. Jahrb., Abth. Anat., XV. 679. (*Melithreptus*) (1902); VILLEN., Feuil. Jeun. Natural., XXXIII. 147 (1903); KETEL., Progr. Pasewalk., 9 *obs* (*Melithreptus*) (1903); LAMPA, Entom. Tidskr., XXV. 212. t. I. f. 7. (1904); ALDR., Catal. N.A. Dipt., 373. (1905); BEZ., Ditt. Eritrei II. 14.55. (1908) et Dipt. Syriaca et Ægypt., 21.57. 95. (1909); BECK., BEZ., KERT. u. STEIN, Catal. Palæarkt. Dipt., III. 76. (1907); KERT., Catal. Dipteror., VII. 140. (1910); LUNDB., Dipt. Danica, V. 342-345, f. 129, 130. (1916).

SYNONYMY:—libatrix SCOP., Entom. Carn., 346.933 (*Musca*) (1763); VILL., Entom. Linn., III. 521.283. (*Musca*) (1789); SCHIN., Verh. zool.-bot. Ver. Wien, VI. 416.933 (*Syrphus*) (1856) et VII. 448. (*Syrphus*) (1857).

gemmatus SCOP., Entom. Carn., 356.965. (*Conops*) (1763); SCHIN., Verh. zool.-bot. Ver. Wien, VI. 418.965. (*? gen*) (1856) et VII. 448. (*Melithreptus*) (1857).

fasciata O.F. MULLER, Fauna Ins. Friedrichsd., 85.757 (*Musca*) (1764), et Zool. Dan. Prodr., 173.2035. (*Musca*) (1776); VILL., Entom. Linn., III. 546.379 (*Musca*) (1789).

menthastri DEG., Mem. p. serv. l'Hist. Ins., VI. 119.10. (*Musca*) (1776).

invisita HARR., Expos. Engl. Ins., 83. t. XXIV f. 31. (*Musca*) (1782).

menthastri FALL., Dipt.Suec.,Syrph., 48.24. pp. (*Scæva*) (1817).

?*limbata* MACQ., Rec. Soc. Sci. Lille, 1828, 220.3. (1829) et Suit. à Buff., I. 552.6. (1834); MEIG., System. Beschreib., VII. 139.118. (*Syrphus*) (1838) ; SCHIN., Verh. zool.-bot. Ver. Wien, VII. 372.16. (*Melithreptus*) (1857); MALM., Gœteb. Kongl. Vet. Handl., 1863.49. (1863).

?*sinuata* MACQ., Suit. à Buff., I. 553.10. (1834); MEIG., System. Beschreib., VII. 139.120. (*Syrphus*) (1838); SCHIN., Verh. zool.-bot. Ver. Wien, VII. 372.18. (*Melithreptus*) (1857).

?*analis* MACQ., Suit. à Buff., I. 553.9. (1834); MEIG., System. Beschreib., VII. 139.119. (*Syrphus*) (1838); SCHIN., Verh. zool.-bot. Ver. Wien, VII. 373.19. (*Melithreptus*) (1857).

Var. dispar LW., Programm. Posen, 1840.37.5.t. 53-54. (*Melithreptus*) (1840) et Isis, 1840. VIII. 578.5. t.,f.53-54. (*Melithreptus*) (1840); GIMM., Bull. Soc. Imp. Nat. Moscou, XX. 2., 174.1. (*Melithreptus*) (1847); ZETT., Dipt. Scand., VIII. 3157. 1-2. (1849) ; SCHIN., Verh. zool.-bot. Ver. Wien, VII. 370.2. (*Melithreptus*) (1857) et Fauna Austr., Dipt., I. 317. (*Melithreptus*) (1862); BONDS., Finl. tvaving. Ins., I. 258.2. (1861); PALMA, Annal. Accad. Asp. Natur. Nap., (3). III. 57.92 (1863); MALM., Gœteb. Kongl. Vet. Handl., 1863.47. (1863); ROND., Atti. Soc. Ital. Sci. Nat. Milano, XI. 26. (1868); KOW., Wien. Entom. Zeitg., IV. 134. (*Melithreptus*) (1885); NEUHAUS, Dipt. Marchica, 113.7. (*Melithreptus*) (1886); BECK., Berl. Entom. Zeitschr., XXXIII. 190.191. (*Melithreptus*) (1889); STROBL, Mittheil. Naturwiss. Ver. Steiermark, XXIX. 1892.162. (*Melithreptus*) (1893); VERR., Brit. Fl., VIII. 431. (1901); WILLEN., Feuil. Jeun. Natural., XXXIII. 147. (1903).

= *lavandulæ* MACQ., Rec. Soc. Sci. Lille, 1828.220.5. (1829) et Suit. à Buff., I. 552.5. (1834); MEIG., System. Beschreib., VII. 138. 117. (*Syrphus*) (1838); SCHIN., Verh. zool.-bot. Ver. Wien, VII. 372. 15. (*Melithreptus*) (1857).

= *scripta* ZETT., Dipt. Scand., II. 766. 1. *var. b.* (1843).

Var. nigricoxa ZETT., Dipt. Scand., II. 767.2. (1843) et VIII. 3158.2. (1849); ROND., Dipterol. Prodr., II. 112.2. (1857) ; BONDS., Finl. tvaving. Ins., I. 258.3. (1861); MALM., Gœteb. Kongl. Vet. Handl., 1863.47. (1863); KOW., Wien. Entom. Zeitg., IV. 134. (*Melithreptus*)(1885); STROBL, Mittheil. Naturwiss. Ver.Steiermark, XXIX. 1892.162. (*Melithreptus*) (1893); VERR., Brit. Fl., VIII. 431. (1901); VILLEN., Feuil. Jeun. Natural., XXXIII. 147. (1903).

Var. strigata STAEG., Naturhist. Tidsskr., (2). I. 362.31. (1844); ZETT., Dipt. Scand., VII. 3159. 2-3. (1849); SCHIN., Verh. zool.-bot. Ver. Wien, VII. 370.3. (*Melithreptus*), Fauna Austr., Dipt., I.

316.2. (*Melithreptus*) (1862) et Nov. Reise, Dipt., 347.19. (*Melithreptus*) (1869); Bonds., Finl. tvaving. Ins., I. 258.4. (1861); Kow., Wien. Entom. Zeitg., IV. 134. (*Melithreptus*) (1885); Neuhaus, Dipt. Marchica, 113.6. (*Melithreptus*) (1886); Strobl, Mittheil. Naturwiss. Ver. Steiermark, XXIX. 1892.162. (*Melithreptus*) (1893), Wien. Entom. Zeitg., XVIII. 145.97. (*Melithreptus*) (1899) et Wissensch. Mittheil. Bosn. u. Herceg., VII. 591. (*Melithreptus*) (1900); Lundb., Vidensk. Meddel., 1898. 304.96. (*Melithreptus*) (1898); Verr., Brit. Fl., VIII 432 et 433. (1901); Villen., Feuil. Jeun. Naturel., XXXIII. 147. (1903).

= *philanthus* Schin., (*nec* Meig.), Verh. zool.-bot. Ver. Wien, VII. 371.8. (*Melithreptus*) (1857).

= *picta* Holmgr., Œfv.Kongl.Vet.Akad.Forhandl., XXIX. 100 (1872).

DIAGNOSIS:— The largest and longest species of this genus. Thorax with its side margins continuously yellow; abdomen very elongate.

DESCRIPTION:— *Male:* (Pl. III, fig. 11), Face entirely shining yellow, sometimes with a greenish-yellow tinge, and bearing very inconspicuous, short, pale pubescence; jowls pale yellow, with whitish pubescence, which extends up the back of the head and becomes conspicuously white and coarse at the widening about the middle of the occiput, caused by the incurved margin of the eye; above this, and on the top of the occiput, the pubescence is pale yellow to tawny. Vertex rather shining black with black hairs on the front part, which are curved forward, and with tawny hairs on the hind part. Frons rather produced, entirely yellow, with inconspicuous yellow pubescence. Eyes touching for about eight or nine facets. Antennæ orange-yellow, usually darkened above the third joint, and occasionally with the apex and the upper part dark brown or blackish; on the dorsal surface of the two basal joints there are some minute black bristles; arista brown, quite bare, gradually tapering, and not quite as long as the three joints of the antennæ together.

Thorax moderately shining or even dull, with traces of two broad faint grey lines close together on the front half of the disc; the side margins are all yellow from the humeri to the scutellum, but more broadly and clearly yellow on the front half; pubescence brownish-yellow and sometimes pale yellow, paler and longer on the sides and on the pleuræ; scutellum dull-yellow with rather long pale yellow pubescence and in some specimens, a few black hairs near the apex.

Abdomen dull black or brownish-black, rather shining near

the base and less so near the apex, and with yellow or orange markings ; it is at least five times as long as its broadest part, which is on the second segment, after which it gradually narrows to the end of the third segment and then very slightly widens to the genital knob. The extreme sides of the basal segment are yellow up to the entire and rather broad yellow band which crosses the second segment about its middle ; the third segment has also an entire yellow or orange band which crosses the segment about its middle, but which is much broader than the one on the second segment ; the fourth segment is brownish-orange with a black spot on the middle of the upper margin, which spot extends down vertically for about one third of the segment, and laterally, rather broadly to the side margins ; the lower margin of the fourth segment has a similar, but much larger spot which also extends laterally to the side margins and up a dorsal line for about half the segment; however, all the markings on this segment are usually rather vague and variable in size and shape ; the fifth segment has a black dorsal line on the basal three-quarters, with a pair of black spots outside the end of this line, and, with a black (sometimes vague) elongate spot on each side of the basal margin; after this comes the short and small orange sixth segment followed by a large shining orange cap, with two round black spots over the ball-like genitalia, near the base of which are two brown spots. Very often the black and orange markings of the abdomen run together, thus rendering the orange more reddish and leaving the black markings less defined, especially on the third and fourth segments. Pubescence on the abdomen rather short and mainly following the ground colour, except on the two basal segments where it is long and pale. Venter with rather indistinct alternate bands of yellow and brownish-black ; its pubescence is mainly pale. Hypopygium extremely large, prominent, nearly bare and consisting of a large globular mass which is mostly under the fifth segment, at the end of which is a pair of broad lamellæ with shagreened ends, which bear tufts of long pale hairs; still further concealed are numerous processes with which no one is perfectly acquainted.

Legs almost entirely orange, very simple with short inconspicuous pubescence, which is mostly pale on the front legs, and blackish on the hind legs ; middle femora always with a distinct, more or less black ciliation on the ventral surface ; hind coxæ with long pale yellow hairs; on nearly all the rest of the hind legs, except for the trochanters which are nearly bare, there are small black bristles which are much denser and crowded on the tibiæ. The tarsi are thin and rather darkened on the third, fourth

and fifth joints and possess minute black bristles on the dorsal surface and a short but very tufted tawny-yellow pubescence on the ventral surface.

Wings pellucid, with the extreme base, the stigma and the subcostal cell yellowish. Squamulæ and their fringes pale yellow, and the margins dark yellow. Halteres yellow, yellowish-brown or orange-yellow.

Female: (Pl. III, fig. 9). The shape of the abdomen is more like that of the narrow-bodied species of *Syrphus* or *Xanthogramma*, from which the yellow side-margins of the thorax and the yellow markings of the pleuræ at once distinguish it.

Frons brightly shining black on the upper half and down about the middle third to nearly the base of the antennæ, the sides of this part being yellowish and shining; there is a peculiar faintly raised triangle, extending outwards from the antennæ to the eyes, below which the upper part of the face has a faint greenish tinge; the pubescence on the upper part of the frons is blackish, pale below, and mostly erect.

Thorax with a rather shorter pubescence than in the male. Abdomen rather shining, about four times as long as its broadest point, which is usually about the base of the third segment, from which it very gradually narrows to the end of the sixth segment; the side margins of the abdomen are entirely yellow and in typical *S. scripta* with entire yellow bands on the second, third and fourth segments, of which the band on the second segment is the narrowest, and the band on the fourth segment is emarginate in the middle, behind; the fifth segment has the basal corners and a dorsal line black, as well as two large black spots on the hind margin, which are rather broadly connected with the dorsal line; the sixth segment has a brownish-black spot on the middle of the base, and two smaller ones on the hind margin; the seventh segment is brownish-black with orange-yellow sides; pubescence mainly following the ground colour, short, except about the basal part and the sides.

Length from 11 (male) to 9 (female) mm.

This species, as well as all those belonging to this genus, are liable to great variations, especially as regards the abdominal markings, such as shape, interruption and sharpness of definition of the yellow abdominal bands, as well as the colour of the legs. Out of ten specimens which I possess, six males and four females (which I believe to be the only ones existing in collections from Egypt) there are not two males exactly alike as regards the abdominal markings, and of the four females, three are very dark forms, possessing a black line down the middle of the face, the

antennæ blacker on the dorsal surface and at the apex, and with the three yellow bands of the second, third and fourth segments of the abdomen very narrow and rather widely interrupted in the centre, and on the sixth segment the three black spots almost cover it, so that the specimen is almost identical with the *var. strigata* of Stæger.

S. scripta is a rare species and although it has been recorded from North Africa (Ethiopia) apparently it has never previously been found in Egypt. The small series which I possess, have been captured at Marg (near Cairo), Kerdacé (North East of the Ghizeh Pyramids) and one female from the Wadi-Hoff. My dates extend from February to June. It is known to occur in Asia Minor, Canary Islands, Japan, North and South America, and throughout Europe.

2. S. FLAVICAUDA ZETT. (Pl. I, fig 8 & Pl. III. figs 7, 8 & 10)

ZETT., Dipt. Scand., II. 771.6. (1843) et VIII. 3161.6. (1849); SCHIN., Verh. zool.-bot. Ver. Wien, VII. 372.11. (*Melithreptus*) (1857); PALMA, Annal. Acad. Aspir. Natur. Nap., (3). III. 58.94. t. f. 9-12. (1863); ROND., Atti. Soc. Ital. Sci. Nat. Milano, XI. 25. (1868); VERR., Brit. Fl., VIII. 441.3. f. 315-317. (1901); BECK., BEZ., KERT. u. STEIN, Katal. Palæarkt. Dipt., III. 73. (1907) ; BEZ., Dipt. Syriaca et Ægypt., 57. (21) 96. (1909); KERT., Catal. Dipteror., VII. 135. (1910); LUNDB., Dipt. Danica, 349-352. (1916).

Var. calceolata MACQ., Dipt. Exot., II. 2., 91.8. t. XVI. f. 1. (*Syrphus*) (1842); BLANCH. in GAY : Hist. fis. y polit. de Chile, Zool., VII. 411.6. (*Syrphus*) (1852); PHIL., Verh. zool.-bot. Ges. Wien, XV. 746. 6. (*Syrphus*) (1865) ; v.D. WULP, Notes Leyden Mus., IV 80. 12. (*Syrphus*) (1882) et Tijdschr. v. Entom., XXV. 136. 32. (*Syrphus*) (1882); WILLIST., Trans. Amer. Entom. Soc. Philad., XIII. 311. (*Syrphus*) (1886); ? GIGL.-TOS., Mem. R. Accad. Sci. Nat. Torino, (2) XLIII. 351. 87. (1893); BECK., BEZ., KERT. u. STEIN., III. 73. (1907); BEZ. Ditt. Eritrei, II. 14. 54. (1908) ; KERT., Catal. Dipteror., VII. 198. (*Syrphus*) (1910).

Var. nitidicollis ZETT., Dipt. Scand., VIII. 3163. 8-9 (1849) et XIII. 6009. 8-9 (1859); SCHIN., Verh. zool.-bot. Ver. Wien, VII. 372. 10. (*Melithreptus*) (1857) et Fauna Austr., Dipt., I. 318. (*Melithreptus*) (1862); BONDS., Finl. tvaving. Ins., I. 260. 10. (1861); MALM., Gœteb. Kongl. Vet. Handl., 1863. 49. (1863) ; JAROSCH., Trudy Kharkoff, XI. 371. 58. (*Melithreptus*) (1877) ; KOW., Wien. Entom. Zeitg., IV. 133. (*Melithreptus*) (1885) ; NEUHAUS, Dipt. Marchica, 113. 9. (*Melithreptus*) (1886); BECK.,

STROBL., Mittheil, Naturwiss. Vet. Steiermark, XXIX. 1892. 163. (*Melithreptus*) (1893); VERR., Brit. Fl., VIII. 445. (1901); Villen., Feuil. Jeun. Natural., XXXIII, 147. (1903) ; BECK., BEZ., KERT., u. STEIN, Katal. Palæarkt. Dipt., III. 73. (1907); KERT., Catal. Dipteror., VII. 135. (1910).

= *melissæ* ZETT., Dipt. Scand., II. 770. 5. (female) (1843).

= *tæniata* WALK., (*nec* MEIG.), Ins. Britann., Dipt., I. 299.3. (*Melithreptus*) (1851).

DIAGNOSIS:—Thorax with its side margins yellow only above the suture ; abdomen small and moderately long.

DESCRIPTION:— *Male*, (Pl. III, fig. 7), Face yellow to yellowish-brown, with the sides usually pearly-white and entirely shining ; down the middle, the central knob is often blackish, sometimes with a dark middle line extending downwards to the mouth-edge, while the exact margin of the mouth is usually narrowly black on the front part; pubescence on face very short and inconspicuous; the lower margin of the mouth runs back horizontally to the lower margin of the eyes and is not in the least descending; the jowls are very small with white pubescence which extends up the occiput; this pubescence becomes rather conspicuous and coarse where the margin of the eye is arched inwards, and consequently leaves a much wider space on the occiput visible; above this the occiput becomes much darker and its pubescence is longer and ranging from yellow to dark-tawny ; vertex rather large, bright æneous-black and bearing a dark pubescence; frons of the same colour as the face, not much produced, with short yellow pubescence, but on the top occasionally there are a few black hairs. Eyes reddish to reddish-brown or black, touching for about eight facets. Antennæ dull orange, blackish on the dorsal side and at the apex; arista quite bare, not quite as long as the antenna; it is gradually tapering and obscurely orange at the base, but mostly blackish.

Thorax either quite dull or very shining æneous, with a pair of broad greyish longitudinal lines on the disc near the base, these stripes varying somewhat in distinctness; it is yellow or greenish-yellow on the humeri and on the side margins down to the base of the wings, after which the yellow is interrupted until the postalar calli, which are more or less orange ; the prothorax and nearly all the mesopleuræ. pteropleuræ and metapleuræ are yellow, and there is a large yellow spot at the top of the sternopleuræ; the pubescence is rather long, abundant, pale yellow to tawny, but very inconspicuous; the scutellum is dull orange except

the basal corners which are black; its pubescence is fairly abundant, long and entirely yellow.

Abdomen shining black with extensive orange markings; it is about three times as long as its broadest part, which is usually on the base of the fifth segment, and is very club-shaped as it narrows from its base to the middle of the third segment, after which it rapidly widens to the fifth segment and spreads over the very large genitalia; the second segment has an orange band which is usually well interrupted in the middle and which starts from the side margins near the lower end of the segment, but slopes upwards to the middle of the disc; sometimes this band is continuous; on the third segment the band is much broader and sometimes slightly interrupted in the middle, and is situated higher up than the middle of the segment, so that its upper margin is close to the base of the segment; on the fourth segment the band is very similar in shape to that on the previous one but owing to the larger size of the segment the band is much longer and larger; however, very often the increase of the yellow colour makes the segment appear orange, except for two black elongate spots near the lower margin and two others in the centre of the segment, one of which, small and round, touches the base, and the other more elongate is near the lower margin; on the fifth segment the black portion is reduced to two elongate blackish spots near the basal corners and a fairly broad dorsal line which extends from the base to about two-thirds of the segment and at the end of which, on the sides, are two small, more or less distinct, roundish spots. Pubescence on abdomen rather inconspicuous but long erect and mostly pale about the basal corners and shorter, but also pale, on the side margins; it is short, adpressed and blackish on the disc. Venter orange and black and the black markings of the abdomen, when seen from below, never quite reach the side margins; pubescence shorter and much less conspicuous than on the dorsum. Hypopygium very large, asymmetrical and usually orange with spots on the sides which may either be distinct (three small ones on the left and one larger on the right) or practically absent; the genitalia, which consist of a very large ball under the fifth segment, are continued under the fourth by a pair of large lamellæ, which are rather hairy, especially at their apices.

Legs yellow to orange, quite simple in shape, with darker places which are liable to excessive variations in different individuals. The front pair of legs is usually entirely yellow or orange, but the middle and hind pairs vary considerably, as they may be anything from orange with tiny black bristles on the tarsi, to almost entirely blackish with tiny yellow bristles on the tarsi; and

dark specimens may have orange tarsi and pale specimens dark tarsi. The pubescence on the front femora is either entirely yellow or with the minute hairs black below; behind the middle femora the pubescence is longer and black from the trochanters to the end of the tarsi; except on the inside of the hind tibiæ on the apical half.

Wings rather greyish, pellucid, with the extreme base orange and the stigma yellowish-brown. Squamulæ with their margins and fringes yellowish. Halteres pale yellow.

Female, (Pl.III, fig.8), Rather similar to the male except for the shape and markings of the abdomen. The frons is moderately broad at the vertex and very shining æneous for the entire width of the upper half, which is continued on about the middle third almost to the antennæ; its pubescence is short, inconspicuous and follows the ground colour.

Abdomen more even in shape, less clubbed and not so constricted about the middle. The orange markings on the segments are very variable; the side margins of the first segment are yellow and those of the second segment are very similar to those in the male but rather broader and sometimes interrupted; the band on the third segment is also either entire or interrupted, and arched from near the hind margin at the sides, to near the front margin in the middle; the band on the fourth segment is similar but broader and hence occupies more of the segment and when it is interrupted in the middle it has small projections near the middle, both above and below ; on the fifth segment the band has these projections increased so that the segment is all orange except for a black dorsal line, the basal corners, and the two large corners of the hind margin; the sixth segment is entirely orange except for a broad black dorsal line and two round brownish-black spots on the sides and at the end of the dorsal line. Pubescence also pale about the basal corners and about the sides down to the end of the third segment; below this it is longer than in the male and entirely blackish.

Length from 8 to 6 mm.

Var. calceolata Macq., (Pl.III, fig.10), I do not consider this to be anything but a dark variety of the above species in which the femora are considerably darker and the abdomen with the orange markings less extensive, thus leaving the abdomen darker but with the orange markings also greatly varying in almost every individual. This variety seems to correspond almost exactly with the European *var. nitidicollis* Zett. of *S. flavicauda*. In some of my specimens the abdominal markings of the male run together, i.e. the orange

markings become obscure reddish-orange and more extended, so that the contrast between the orange and the black becomes blurred.

Almost all the species of this genus have a strong tendency to form local races or forms, of which probably large numbers have been described as distinct species, and my belief is that until a serious study and comparison of the male genitalia is completed, none of the other small species in this difficult genus can be described accurately or named with certainty; moreover, it follows that until such a point is reached, it is less confusing and quite as correct to collect together all the various names (of which there are no doubt some, if not many, synonyms) under the headings of a very few species, although some mistakes may occur.

This species as well as its dark form is quite common and very widely distributed in Egypt; my records date from December to the end of October. *S. flavicauda* is also common and very widely distributed in Europe and in addition has been recorded from Syria and its *var. calceolata* from North Africa (*Ethiopia*), Chile, ? Mexico and Europe (*nitidicollis*).

3. XANTHOGRAMMA SCHIN.

Schin., Wien. Entom. Monatschr., IV. 215. (1860).

SYNONYMY:—Sinosyrphus Big., Annal. Soc. Entom. Fr., (6). II. Bull. LXVIII. 4. (1882).

Moderately large *Syrphus*-like species which possess conspicuous yellow or orange markings on the sides of the thorax and the colours on the whole are strongly contrasted on all parts of body. It is very similar to *Syrphus* but is distinguished by the well defined orange markings which extend to distinct side lines on the thorax, and to yellow or orange spots on the pleuræ. Face shining, waxy yellow, practically devoid of pubescence, and in the male, decreasing in width, as it descends. Eyes quite bare. Antennæ with the second joint very short, and the third joint bearing a rather short, bare arista.

Abdomen rather narrow, with the side margins almost parallel (although in the European species it may be broad and marginate); the yellow markings are very conspicuously contrasted against the black ground colour; pubescence short.

Legs simple, slender and almost bare.

Wings with a venation similar to that of *Syrphus*.

Not much is known about the metamorphoses of this genus; Verrall states that the larva has been bred from heaps of turf, but I think that it is very likely that our only Egyptian species is aphidiphagous like the members of its closely allied genera, *Syrphus* and *Sphærophoria*.

1. X. AEGYPTIUM WIED. (Pl. IV. fig 7).

Wied., Aussereurop. Zweifl., II. 133.29. (*Syrphus*). (1830); Lw., Œfv. Kongl. Vet. Akad. Forhandl., XIV. 1857.378.19. (*Syrphus*) (1858), Dipterenf. Südafr., I. 306.4. (*Syrphus*) (1860) et in Peters: Reise n. Mosambique, Zool., V. 17. (*Syrphus*) (1862); Walk., The Entom., V. 274.49. (*Syrphus*) (1871); Verr., Trans. Entom. Soc. Lond., 1898.414.4. (*Syrphus*) (1898); Ricardo, The Nat. Hist. of Sokotra, 369.21. (*Syrphus*) (1903); Beck., Bez., Kert. u. Stein, Katal. Palæarkt. Dipt., III. 73. (*Sphærophoria*),

(=*scutellare* FABR.) (1907); KERT., Catal. Dipteror., VII. 150. (=*scutellare* FABR.) (1910); Bez., Ditt. Eritrei, II. 14. (=*scutellare* FABR.) (1908), Ditt. raccolti d. Leo. Fea, Ia. 10.11., (409), (410),. 8. (1912), Syrph. Ethiop. Region, 36.37.31. (1915) et Syrph. æthiop. Mus. Nat. hungarici, 138 (8) 25. (921).

SYNONYMY:—longicorne MACQ., Dipt. Exot., II. 2., 94.13. t.f. 5. (*Syrphus*) (1842) ; BECK., Mitteil. Zool. Mus. Berl., II. 84. 121. (*Syrphus*) (1903).

?fuscotibiale MACQ., Dipt., Exot., II. 2.95.14. t. XVI. f. 4. (*Syrphus*) (1842).

?nasatum MACQ., Dipt. Exot., II. 2. 96.15. t. XVI. f. 6. (*Syrphus*) (1842).

natalense MACQ., Dipt. Exot., suppl. I. 134.28. (*Syrphus*), (1846); BIG., Annal. Soc. Entom. Fr., (3). III. 435. (*Syrphus*) (1859).

?felix WALK., Insecta Sanders., Dipt., I.229. (*Syrphus*) (1852); LW. Dipterenf. Südafr., I. 303.4. (*Syrphus*) (1860).

brachypterum THOMS., Eugenies Resa, Dipt., 496.86. (*Syrphus*) (1869).

Pfeifferi BIG., Annal. Soc. Entom. Fr., (6). IV.89.5. (*Syrphus*) (1884).

senegalensis GUÉR., Iconogr. d. Regne. Anim., Ins., 545. t XCIX. f. 3. (*Syrphus*) (1835).

DIAGNOSIS:—This is one of our most elegant and handsome Syrphids and it may be easily distinguished by the strong spine on the hind trochanter in the male, by the parallel sides of the abdomen, and its bright contrasted colours.

DESCRIPTION:— Male, (Pl. IV, fig. 7 & Pl. II, figs. 5 & 6). Face and frons entirely clear waxy yellow with a very short and pale pubescence ; vertex shining black, elongated and possessing very short tawny hairs ; occiput covered with tawny-yellow dust and pubescence which are tawny-yellow above and gradually get paler until they become pure silvery-white below. Eyes bare and touching for a distance equal to about the length of the frons. Antennæ reddish-yellow or reddish-brown with the dorsal side of the three segments brownish; the two basal segments bear numerous small black bristles ; arista rather short, bare and brownish-yellow.

Thorax shining æneous-black with bluish or greenish sheen and with broad, conspicuous yellow side-lines which extend from

near the base to the postalar calli ; there is a large elongate light yellow spot on the mesopleuræ, at right angles to the side lines of the thorax, and a small yellow spot on the sternopleuræ in a straight line with the elongated spot above it ; pubescence on the thorax is dense blackish brown, but rather short and inconspicuous ; it is longer and tawny on the sides and still longer and paler on the pleuræ. Scutellum dull yellow with pale hairs on the disc, but with a row of even and longish yellow hairs on the margin.

Abdomen elongate, almost as wide as the thorax and with the side margins almost parallel; it is dull brownish-black but shining on the lower margins of the segments and with conspicuous yellow or orange-yellow bands which extend over the side margins. The basal segment is shining black and possesses two yellow, roundish, lateral spots, which extend only a little way on the dorsum ; the second segment possesses a broad orange-yellow transverse band, which is nearly as wide as half the length of the segment and situated in the middle of the segment ; this band is more or less deeply constricted in the centre and sometimes interrupted ; the orange-yellow band on the third segment is quite continuous, as wide as half the length of the segment, and is situated on the upper half (i.e. its upper margin near the basal margin of the segment) ; the fourth segment has a yellow hind margin and an uninterrupted yellow band which occupies exactly the upper half (i.e. from the upper margin to the middle of the segment); in these two last segments, the dark background is often much faded, and gives the effect of the colours running together, and hence the contrast is much less conspicuous than in the second segment ; the fifth and sixth segments are reddish-brown and sometimes the upper margin of the fifth segment is dark brown with a yellowish hind margin ; pubescence on the abdomen very short, inconspicuous and mainly following the ground colour except on the first segment and the upper half of the second segment, where it is longer and very pale.

Venter pale yellow and very transparent on the three basal segments where the dark background of the dorsum shows through ; on the four apical segments it is brown or dark brown with darker places ; on the second and third segments there are two median, oval, brown or blackish spots, which are situated on the lower half of the segment, and the spot on the second segment is larger than the one on the third. Hypopygium dark reddish-brown and rather shining ; pubescence on venter very scarce, short, pale and inconspicuous.

Legs entirely yellow except the front coxæ, the three middle joints of the front tarsi and the three apical joints of the

hind tarsi which are dark brown or blackish ; there is also a broad dark brown ring on the hind femora, near the apex; the hind trochanters each bear a large and strong spine, which is yellow and directed backwards and downwards, (Pl. II, fig. 5) ; the inner claws of the front tarsi are bicuspidate, (Pl. II, fig. 6). Pubescence on the legs very short, tawny yellow and inconspicuous, and on the hind tarsi blackish; the last rounded joint of the front tarsi possesses a few longish yellow bristles above, also the middle tarsi, but the bristles are fewer, while the fifth joint of the hind tarsi bears about six very long bristles.

Wings pellucid with the subcostal cell yellow, and the stigma, as well as the base of all the veins pale brown ; Radius 4 + 5 is strongly arquate outwardly, its deepest curb being just after the radio-median cross-vein. Squamulæ white, with a yellow margin and white fringes. Halteres yellow.

Female.—Rather similar to the male. The antennæ are much darker above. Vertex and the upper part of the frons are shining black with a vertical, narrow black band in the centre, which extends to the antennæ, and which is brownish at about the middle; the rest of the frons and all the face is waxy-yellow. The black and yellow markings on the last four or five abdominal segments are usually much more distinct than in the male and the yellow band on the second segment is never interrupted. The yellow band on the fourth segment occupies about three-fourths of the segment leaving the base black ; it is a little emarginate below ; the lower margin of this segment is yellow. The fifth segment is shining black with its hind and lateral margins yellow. The sixth segment is dark brown, with its lateral margins sometimes yellow, and the seventh segment is dark brown, almost blackish. Ovipositor shining black. The tarsi in general, and also the ring on the hind femora are lighter coloured.

Length from 9½ to 11 mm.

Although this species is not rare in Egypt I have never known in to occur abundantly. It occurs in Cairo and its neighbourhood, Alexandria, Helwan, Wadi Hoff, Wadi Rishrash and my dates are from June to May.

X. ægyptium has for some time been considered as a synonym of *X. scutellaris* Fabr. and is known to occur throughout North Africa and in the Ethiopian Region.

4. LASIOPHTHICUS ROND.

Rond., Nuov. Annal. Sci. Nat. Bologna, (2). II. 459. XXXI., (*Lasiopthicus*) (1844) et Annal. Acc. Asp. Nat. Nap., III. 157. (*Lasiophticus*) (1846).

SYNONYMY:—*Catabomba* Ost.-Sack., West. Dipt., Bull. Geolog. Survey, III. N° 2. 325. (1877) et Catal. N.A. Dipt., ed. ii. 244. (1896); Willist., Syn. N.A. Syrph., 62.(1886); Mik, Wien.Ent. Zeitg., I. 154., VII. 222. (1888); Verr., Brit. Fl., VII. 333., Cat. Syrph., 55. (1901).

This genus is distinguished from the Genus *Syrphus* by the very much inflated frons in both sexes, owing to which the space between the eyes diminishes from the frons to the mouth ; in the male there is also an area of large facets on the upper and middle portion of the eye.

The metamorphoses of members of this genus have been known since 1760 when Linnæus speaks of the larva of *Musca pyrastri* found feeding among Aphids on *Pyrus*. *Lundbeck* also states that the same larva is mentioned by Réaumur (1737) as occurring on *Sambucus* and *Lonicera;* by De Geer (1776) on *Rosa* (*Musca rosæ*); by Meigen (1822) on *Sonchus oleraceus;* by Vallot (1834) on *Cannabis;* by Curtis (1857) on *Brassica oleracea* on the shore in July ; and by Schiner (1857) from *Carduus*. Verrall also states that the same species was bred from *Rosa*, and from larvæ feeding on *Aphis brassicæ* and *pruni*, and on an Aphis from *Centaurea*.

Lundbeck gives the following description of the larva of *L. pyrastri*: "it is not much flattened, tapering towards the anterior end and with strong mouth hooks; it is strongly transversely corrugated, and the dermis is shagreened from densely placed small spines; on the ventral side there are seven transverse swellings, each belonging to a segment ; the swellings are divided into some warts somewhat similar to prolegs. On the dorsal side there are some longer hairs or spines, placed, distantly in transverse rows on some of the corrugations, and similar ones are found along the sides; they are regularly placed quite in the same way as described for *Platychirus* viz. on the second to seventh abdominal segments, two on one corrugation in the middle, and on the following corrugation two on each side, besides the three lateral ones longer

downwards; then follow two corrugations without spines, and hereafter the same arrangement is repeated; these segments are each devided into four corrugations and the spines are placed on the two middle ones; on the first abdominal segment and on the meso'and metathoracal segments these are six spines on each on one corrugation, and on the first abdominal segment also three at the side. At the posterior end the body terminates below with a somewhat cushion-shaped part, and above it is a cavity in which the brown posterior spiracles lie close together, but not on any process; each spiracle shows three slits; the anterior spiracles are small, placed above the prothoracal segment on each side. The larva is green with a yellow or whitish-yellow line along the dorsum and a narrower and sometimes less distinct line along each side. The pupa is elongated ovate, broad and rounded in front, not much tapering behind ; it has the same spines or hairs as the larva; the posterior end is bent a little downwards and above it are the posterior spiracles in the same cavity as in the larva. The pupa is at first green, later on it becomes more brown and more pellucid, and the enclosed fly is then distinctly seen through the puparium. The length of the pupa is about 9 mm. The pupa rests attached with the posterior end to some leaf or stalk, but Martelli records that at time of pupation the larva leaves the plant and goes 2-3 cm. into the earth and pupates there. According to Martelli the eggs are elliptical in shape, 1.13-1.26 mm. long, of milk-white colour, with the shell ornamented; they are deposited singly on leaves with Aphids; the same author gives interesting notes about the copulation and tells that the female flies with the male on the dorsum to a secure place; he gives the duration of the copulation as about three hours."

TABLE OF EGYPTIAN SPECIES.

2 (1) Yellow bands on sides of thorax present ; abdominal lunules wider and those on the third and fourth segments very little arched with their inner ends always touching the upper margin, (Pl. IV, fig. 5).... **1 pyrastri** L.

1 (2) Yellow band absent on sides of thorax ; abdominal lunules more or less narrow, those on the third and fourth segments much arched, their inner ends very rarely touching the hind margins, (Pl. IV, fig. 4 and Pl. I, fig. 11)............ **2 albomaculatus** MACQ.

1. L. PYRASTRI L. (Pl. IV, fig. 5).

L., Syst. Nat., X. 594 (*Musca*) (1758), XII. II. 987. 51. (*Musca*) (1761); RÉAUM., Mém. Ins., III. t. XXX. f. 9. (—) (1737); PODA, Ins. Mus. græc., 115. (*Musca*) (1761); SCOP., Entom. Carn. 345. 931. (*Musca*) (1763); O.F. MULL., Fauna Friedrichsd., 721. (*Musca*) (1764); GEOFFR., Hist. Ins., II. 517. 46. (—) (1764); FABR., Syst. Entom., 771. 42. (*Syrphus*) (1775), Spec. Ins., II. 432. 58. (*Syrphus*) (1781), Entom. Syst., IV. 305. 102. (*Syrphus*) (1794) et Syst. Antl., 249. 3. (*Scæva*) (1805); SCHRANK, Enum. Insect., 447. 907. (*Musca*), (1781) et Faun. Boica, III. 115.2431. (*Musca*) (1803); GMEL, Syst. Nat., V. 2875. 51. (*Musca*) (1788); VILL., Entom. Linn., III. 447. 100. (*Musca*) (1789); ROSSI, Fauna Etr., II. 299. 1479. (*Syrphus*) (1790); CEDERH., Faunæ Ingr. Prodr., 306. 962. (*Syrphus*) (1798); DONOV., Brit. Ins., XII. 19. t. 401. f. 1. (*Musca*) (1807); ILLIG., Fauna Etr. Rossi, II. 454. 1479. (*Syrphus*) (1807); LATR., Hist. Nat. Crust. Ins., XIV. 363. 2. (*Syrphus*) (1803) et Gen. Crust. Ins., IV. 325. (*Syrphus*) (1809); FALL., Dipt. Suec. Syrph., 39.5. (*Scæva*) (1817); MEIG., System. Beschreib., III. 303. 44. (*Syrphus*) (1822); DUMÉR., Cons. Gén., t. IV. f. 10, (*Syrphus*) (1823); MACQ., Rec.Soc.Sci.Lille, 1827. 252. (104).41. (*Syrphus*) (1827) et Suit. à Buff., I. 536. 3. (*Syrphus*) (1834); VALLOT, Bull. Soc. Entom. Fr., III. LXV., (*Syrphus*) 1834); WESTW., Introd., II. 557. f. 130. 21. et 131. 7. (*Syrphus*) (1840); CURT., Garden. Chron. ,1842. 1441. (*Scæva*) (1842) et Farm. Ins., 80. (*Syrphus*) (1860); ZETT., Dipt. Scand., II. 703. 5. (1843) et XIII. 5091. 5. (*Scæva*) (1859); ROND., N. Annal. Sci. Nat. Bologna, (2) VIII. 340. *nota* (1847) et Dipterol. Prodr., II. 139. 7. (1857); WALK., List Dipt. Brit. Mus., III. 579. (*Syrphus*) (1849) et Ins. Britann., I. 287. 2. t. x. f. 12. (*Syrphus*) (1851); RATZEB., Forstins., III. 150. (*Syrphus*) (1844); SCHIN., Verh. zool.-bot. Ges. Wien, VII. 338. 7. (*Syrphus*) (1857) et Fauna Austr., I. 301. (*Syrphus*) (1862); BONSD., Finnl. Insekt., I.: 235.5. (*Scæva*) (1861); BOISD, Entom. hortic., 631. (*Syrphus*) (1867); FRNLD., Verh. zool.-bot. Ges. Wien, XVII. 456. (*Syrphus*) (1867); OST.-SACK., Bull. Geolog. Survey, III. 325 (*Catabomba*) (1877) et Trans. Ent. Soc. Lond., 1884. 495. 5. (*Syrphus*) (1884); WILLIST., Syn. N. A. Syrph., 63. t. IV. f. 1. (*Catabomba*) (1886); ADOLPH, N. Acta Leop. Carol. Acad., XLVII. t. II. f. 3. (*Syrphus*) (1885); GRIFF., Bull. Mus. Torino, VIII. (143). 6. (*Catabomba*) (1893); F. LYNCH., An. Soc. Cient. Argent., XXXIV. 120. 2. (*Catabomba*) (1893); SNOW., Kans. Univ. Quart., III. 232. (*Catabomba*) (1895); GIRSCHN., Ill. Wochenschr., 658.

(*Syrphus*) (1897); PLATEAU, Mém. Soc. Zool. France, 1900. 277. (*Syrphus*) (1900); VERR., Brit. Fl., VIII. 334. l.f. 278-279. (*Catabomba*) (1901); How., Ins. Book, t. XXI. f. 27. (1902); ALDRICH, Cat. N.A. Dipt., 363 (1905); BEZ., Dipt. Syriaca et Ægypt., 93. 57. (1909), Ditt. raccolti d. Leo Fea, (407). 6. 8. (1912) et Syrph. Ethiop. Reg., 3. 25., 31. (1915); BECK., BEZ., KERT. u. STEIN, Kat. Palæarkt. Dipt., III.55.(1907); KERT., Cat. Dipteror., VII.98.(1910); OSBURN., Journ. N. Y. Entom. Soc., 58 (1910); LUNDB., Dipt. Danica, V. 261. 263, f. 116, 117. (1916).

SYNONYMY:—*affinis* SAY., Journ. Acad. Philad., III. 93. 9. (*Syrphus*) (1823) et Compl. Writ., II. 81. (*Syrphus*) (1859); WIED., Aussereurop. Zweifl., II. 117.2. (*Syrphus*) (1830).

mellinus HARR., Expos. Engl. Ins., 30. t. XXIV. f. 23. (*Musca*) (1776).

rosæ DEG., Ins., VI. 108.5. t. VI. f. 15-19. (*Musca*) (1776).

transfugus FABR., (*nec.* L), Entom. Syst., IV. 306. 104. (*Syrphus*) (1794) et Syst. Antl., 250. 5. (*Scæva*) (1805); KETEL, Programme Pasewalk, 9, (*Syrphus*) (1903).

var. flavoscutellatus GIRSCHN., Wien. Entom. Zeitg., III 197. 11. (*Syrphus*) (1884).

var. unicolor CURT., Brit. Entom., 509. (*Scæva*) (1838); VERR., Entom. Monthly Mag., V. 21. (*Syrphus*) (1869).

DIAGNOSIS:—Yellow bands absent on sides of thorax ; abdominal lunules more or less narrow, these on the third and fourth segments much arched, their inner ends very rarely touching the hind margins.

DESCRIPTION:—*Male:* Head wider than the thorax and as wide as the widest part of the abdomen. Face greyish-yellow with a narrow brownish middle line which extends to about half way between the mouth and the antennæ, but which is partially continued below, round the mouth edge and more widely across to the eyes. Frons so large and inflated that the face actually diminishes in width from the frons all the way down to the mouth. The frons is darker coloured than the face and is densely and conspicuously clothed with blackish erect pubescence. Pubescence on the face rather dense and varying from being almost uniformly whitish and inconspicuous, to being blackish on the sides and middle, but yellow between and below. On the jowls, the pubescence is pale, becoming almost white on the occiput, but yellow again near the upper part of the occiput, with a few longer, almost black hairs overhanging the eyes. Vertex black with blackish pubescence on

the disc but the pubescence behind is yellow. Eyes densely clothed with pale brown hairs which do not extend to the upper and middle portions where the facets are larger; on the front and back the facets are much smaller. Antennæ with the first joint lighter in colour, as a rule it is reddish-brown, the second joint brownish-black, and the third still darker, almost black; the third joint is rather long and bears about a third from its base a bare arista, which is brown, longer than the joint and with more than its basal half thickened.

Thorax rather shining bluish-black but obscurely tawny along the sides. Pubescence dense brownish-yellow in colour. Scutellum brownish-yellow when seen sideways, but when seen from above, the basal two thirds is more obscure, and the tip brownish-yellow; it bears rather long, dense, light yellow pubescence.

Abdomen deep dull black with shining areas and possesses three pairs of yellowish-white, yellow or orange lunules. On the second segment these lunules are almost straight and equal, but on the third and fourth segments they are sloped upwards towards the front margin, from about the middle of the side of the segment; they are narrowed about their middles and dilated at their inner ends which, sometimes touch the front margin; none of these lunules go near to the actual side margin; the fourth and fifth segments have narrow yellow hind margins. Pubescence short and mainly following the ground colour except on the side margins near the base where it is long and pale brownish. Hypopygium small.

Legs with the basal half of the anterior femora blackish; the hind femora are all blackish except the distal end; all the tarsi are darkened above. Pubescence is mostly blackish behind the anterior femora, but on the hind femora it is nearly uniformly yellowish; there are some tiny bristles on the hind tibiæ and tarsi which are yellowish except for a few black ones in front of the hind tibiæ.

Wings pellucid, with the subcostal cell and stigma pale brown. Squamulæ and their fringes whitish, but their margins yellow. Halteres yellow or orange.

Female, (Pl.IV. fig.5).—Similar to the male; face is about equally wide at the vertex and mouth owing to its sides being very gently out-curved; face is pale yellow with a small darkened central line below and possessing uniformly pale pubescence. Frons inflated and vaguely darkened especially on the large dark spots above the antennæ, when it is viewed from the front; its pubescence is uniformly dense, short and black. The upper part of the occiput, when seen from above is shining æneous and rather inflated. Facets of the eyes all equal. Pubescence on the thorax is slightly shorter and

lighter in colour. Legs with the blackish markings inclined to be less extensive. Squamulæ white.

Length from 12 1/2 to 14 1/2 mm.

This species is liable to great variation both in size and shape of the abdominal markings, and in Europe the female has a well known variety *unicolor* "in which the abdominal markings entirely disappear."

L. pyrastri seems to be extremely rare in Egypt and I much suspect its having been imported from Syria, Italy, or Europe, as the only two specimens which have been recorded (and which I have examined) have both been captured in cultivated land where plants and trees have been imported.

The larva is said to be green with a purplish dorsal stripe and feeds ravenously on Aphids. It was bred from *Aphis brassica*, *Aphis pruni* and from an *Aphis* on *Centaurea* in Europe.

This species is known to occur in Europe, Canary Islands, Madeira, America and Western Asia.

2. L. ALBOMACULATUS MACQ (Pl. IV. fig 4 & Pl. I, fig 11)

Macq., Dipt. Exot., II. 2. 86. 1. t. XV. f. 6. (*Syrphus*) (1842); Lw., Dipterenf. Südafr., I. 303. 8. (*Syrphus*) (1860); Mik., Wien. Entom. Zeitg., VII. 222. 61 (*Catabomba*) (1888); Verr., Brit. Fl., VIII., Catal. Syrph., 56. (*Catabomba*) (1901); Beck., Zeitschr. f. System. Hymen. u. Dipt., VII. 243. *Anmerk.* (*Catabomba*) (1907); Bez., Dipt. Syriaca et Ægypt., (21). 57. 92. (1909).

SYNONYMY:—*Gamellarii* Rond., Ann. Acc. Asp. Nat. Nap., III.157. (*Lasiophticus*) (1845-46), Dipt. Prodr., II.139.6. (*Lasiophthicus*) (1857) et Annal. Mus. Civ. Genova, IV. 295. (*Lasiophticus*) (1873); Schin., Verh. zool.-bot. Ges. Wien, VII. 339. 8. (*Syrphus*) (1857), Fauna Austr., I. 301. 5. (*Syrphus*) (1862) et Nov. Reise, Dipt., 351. 34. (*Syrphus*) (1868); Rœder, Wien, Entom. Zeitg., II. 94. (*Catabomba*) (1883); Mik, Wien. Entom. Zeitg., VII. 222. 61. (*Catabomba*) (1888) et IX. 295. (*Catabomba*) (1890); A. Costa, Atti. R. Accad. Napoli, (2) V. No. 14, 24. 41. (*Syrphus*) (1893); Ketel, Programm Pasewalk, 12 *Observ.* (*Syrphus*) (1903).

DIAGNOSIS:—Yellow bands on sides of thorax present; abdominal lunules wide, and those on the second and third segments slightly arched with their inner ends always touching the upper margins.

A rather large and very handsome species much resembling *L. pyrastri* but easily separated by the above characters.

DESCRIPTION:—Male, (Pl. IV, fig. 4 & Pl. I, fig. 11).—Face bright shining yellow with a black middle line which does not nearly extend to the antennæ, but which is partially continued below round the mouth-edge, narrow in the hollow below the antennæ and much increasing in width to the upper mouth-edge. Frons very large and inflated; it is a little darker than the face and clothed with dark grey, rather abundant pubescence. Pubescence on face also fairly abundant, but very short and almost white below, and dark grey and a little longer above by the sides of the antennæ. Vertex very small, black, with blackish pubescence on the disc, but pale behind. Occiput entirely covered with white silvery dust and dense, rather long, almost pure white and fairly conspicuous pubescence. Eyes covered with short pubescence which is light brown in front, and pale, almost white on the middle; the top of the eyes and the hind margins are free from pubescence ; the facets on all the upper part of the eyes, except just on the front and back are much larger than the others. Antennæ more or less reddish-brown to brownish-black, with the two basal joints usually lighter in colour, as well as the ventral side of the rather long third joint; arista yellowish-brown and bare; it is inserted before the middle of the third joint and thickened for more than its basal half.

Thorax very shining blackish-blue, but yellow on the sides. Pubescence not dense, very pale greyish-white to white, except on the sides where it is rather dense, tufted, and yellowish, especially in front. Scutellum brownish-yellow when viewed sideways, but always obscured by transparency when viewed from above, and its pubescence is not dense but fairly long and almost uniformly whitish. Abdomen deep, dull, somewhat velvety black, but shining on the lower margins of the three basal segment, and with three pairs of thick, pale yellow, yellow, or orange-yellow lunules. The first pair of lunules which are on the second segment are almost straight, but narrower at their inner ends. The second and third pairs of lunules on the third and fourth segments respectively, are sloped on their upper margin, from about the middle of the side of the segment upwards towards the front margin; they are distinctly narrowed about their middle and dilated at the inner ends which usually touches the front margin; none of these lunules actually touch the side-margins. The fourth and fifth segments have yellow, narrow hind margins. Pubescence short, mainly pale, whitish and occasionally there are a few darker hairs interspersed

among the white, with blackish hairs on the side margins, except on the first two segments where it is very long and tufted, especially on the sides, and varying from pure white, to greyish-white; the pubescence on the fifth segment is longer than that on the preceeding two segments, but shorter than on the two basal segments, and varies from being almost pure white to greyish-brown.

Venter shining, bright yellow to brownish-yellow, with three large central, elongated black markings, one on each of the second, third and fourth segments; the remaining distal segments vary from being reddish-brown to yellowish-brown in colour. Hypopygium small and reddish-brown.

Legs orange-yellow with the basal third of the anterior femora, and all the hind femora, except the distal end, black, as well as the three middle tarsi blackish. Pubescence on the front legs very short, pale and inconspicuous and on the hind legs longer, and blackish on the outer edge of the tibiæ only.

Wings pellucid with all the veins yellowish-brown at the base and darker at the tip, and with the sub-costal cell yellowish-brown. Squamulæ and their fringes white, but their margins yellow; the fringes of the thoracal squamulæ are very delicate and about five times as long as those of the alar pair. Halteres pale yellow to orange.

Female.—Very similar to the male; frons inflated and darkened on two blotches above the antennæ; facets of the eyes all equal.

Length from 13 to 15 mm.

This seems to be a rather common desert species and the larva is probably aphidiphagous like its near ally *L. pyrastri.* I have watched and caught the adult hovering over and around bushes of *Iphiona mucronata and Zygophyllum coccineum* in the Wadi Hoff, about and even after sunset. I also possess a few specimens caught in the desert along the Suez road, but I have never seen it nor do I know of any specimens of this insect being captured near towns or cultivated land. There is no doubt about there being more than five or six broods in the year as my dates are from January to November. It is known to occur in Southern Europe, North Africa, Canary Islands, Madeira, Asia Minor and North Persia.

5. SYRPHUS FABR.

Fabr., Syst. Entom., 762. 172. (1775).

SYNONYMY:—Scæva Fabr., Syst. Antl. 248.57. (1805).

Psilogaster Lioy, Atti. Instit. Veneto, (3) IX. 753. 12. (*Psylogaster*) (1863-64) *nec* Blanch., Hym., 1840.

Epistrophe Walk., Ins. Sanders., III. I. 242. (1852).

Species of moderate size, blackish or æneous and clothed with moderate pubescence; always with yellowish markings on the face, scutellum and abdomen, but not on the pleuræ, even though the yellow colouring may be sometimes very faint on the face and scutellum. Eyes always touching on the frons in the male, but well separated in the female; they are usually bare and sometimes hairy. Antennæ moderate in length and in shape; it always bears near the base of the oval third joint, a bare arista.

Wings possess the most typical *Syrphus* venation, with Radius 4+5 almost straight; alula fairly well developed and when at rest the wings lie parallel over each other on the abdomen.

The metamorphoses of several species of *Syrphus* have been studied and in the case of some species, have been known for a long time. *S. ribesii* (a very common European species) was observed by Linnæus and Fabricius who both speak of the larva as occuring "inter Aphides." Réaumur mentions the larva of *S. balteatus* (?) among Aphids on *Prunus* and *Ribes*. Verrall states that it is probable that De Geer's exhaustive describtion of the metamorphoses of his *Musca pinastri* referred to *S. corollæ*. Fallen also found the larva of *S. corollæ* feeding on Aphids on *Brassica oleracea*. Bouché has also described the larvæ of *S. ribesii* and *S. balteatus*. Schiner states that he found the pupa of *S. nitidicollis* in April under a stone in a humid meadow and that it metamorphosed after a short interval. Lundbeck says that according to Brauer, Weyenberg mentioned the developmental stages of *S. balteatus* and *corollæ*. Verrall says that *S. balteatus* and *auricollis* have been bred from larvæ found feeding on *Aphis pruni*. Martelli mentions the larvæ of *S. ribesii, bifasciatus, balteatus* and *auricollis* as feeding on *Aphis brassicæ*. Lundbeck has also found

larvae and examined the developmental stages of many European species of *Syrphus* in Denmark amongst which he mentions *S. corollæ,* the larvæ of which he found among Aphids on *Prunus* on June 3rd and which developed into adults on June 22nd; *S. balteatus,* the larvæ of which he found among Aphids on *Sambucus* and on *Brassica,* and pupæ of the same species on *Rosa, Rheum, Typha,* and *Phragmites.* He describes the larva as being "always more or less leech-like; it is somewhat flattened with a flat ventral surface, the dorsal surface more or less slightly arched; the body is attenuated or pointed towards he head-end, broad behind, sometimes a little rounded; it is more or less strongly transversely corrugated so that the single segments are not easily made out. Below there are seven more or less distinct, transverse swellings, which may be more or less distinctly devided into proleg-like warts, and have small spines. The larvæ may otherwise be somewhat different; some are almost smooth above, the dermis only finely shagreened, and there are short, soft bristles on some of the corrugations and at the sides; in others the shagreened structure is developed into a clothing of five, short and dense spines, and there are the same soft bristles; in a third group the dermis is rather coarsely shagreened and on the dorsum of the segments are large, conical warts, and similar at the sides or here they are developed into conical filaments; the short bristles and the conical warts or filaments, which answer to each other, are present in the same number and arranged quite in the same way as described above for *Platychirus* and *Lasiophthicus;* there are consequently on the meso- and metathoracal segments six in a transverse row, besides a couple at the side; on the first abdominal segment there are likewise six, placed on one corrugation, and on the next six segments two in the middle on one corrugation and two at each side on the next corrugation, and on all seven abdominal segments three on each side; each segment shows four corrugations devided by furrows, and the bristles or warts are placed on the two middle corrugations of each segment. The anterior spiracles are small, lying on each side of the prothoracal segment; the posterior spiracles are placed above on the last segment on a short, slightly longitutinally devided process, more or less elliptical in a transverse section. The mouth is provided with hooks and the head is much retractile and able to be stretched out, and the whole body is likewise very contractile, so that the larva may alter its shape to a rather high degree; when fully stretched out it is long, broad and flat, when contracted it is much shorter, higher and narrower. The colour varies; it may be yellowish, yellowish-grey, grey, reddish-grey or darker, generally more or less marmorate from darker designs and often with one or

more longitudinal lines. The pupa (puparium) is elongately ovate, arched above, somewhat flat below, broad and rounded in front, more or less tapering behind; it is sometimes longer and more drop-like (in the narrow bodied species); it has, of course, the same dermal structure as the larva, only it is generally less pronounced, and the larger warts, when such are present, are smaller and more contracted. The anterior larval spiracles are generally not to be seen, but the posterior process is present as in the larva. The colour is similar to that of the larva, but it is often altered as the development of the imago proceeds, because the colour of the imago shine through the puparium."

The larvæ are all aphidiphagous and are found on the leaves and stalks of various plants among Aphids infesting these.

Further the same author gives a most vivid and interesting account of the feeding process of these predacious larvæ, which I feel it would be of great interest to give here: "...; the larvæ are very voracious; I once had a larva of *S. nitens* which in six days devoured so many Aphids that the white, empty skins of these latter formed a thick layer on the bottom of the bottle ; the larva had during that period grown double the size. It is interesting to examine the larva when feeding ; it is generally sitting amongst a colony of Aphids and it stretches and raises the fore-parts of its body and bends it down to different sides until an Aphid is touched; it then pierces it with its mouth-hooks, detaches it with a jerk, and with the fore-parts of the body in a raised position it sucks it out with a pumping action ; the Aphid is seen to become white, and is quite sucked in one minute or in a few minutes ; it is then thrown off by a small jerk and the action is repeated. Sometimes larvæ have been observed to attack and suck other larvæ of their own kind, such as is also the case with *Lasiophthicus*. The pupa is generally found on leaves or stalks attached by some glue with the hind part... According to Buckton (Mon. of Brit. Aphid. II, Roy. Soc. 119. 1879.), the egg-shell is ornamented with bifurcate papillæ ; the eggs are deposited singly and may often be seen on leaves of oak, fir etc., where they are placed in the midst of Aphids."

It is surprising that this genus should be so poorly represented in Egypt ; of the genus over 60 species are known from the Palæarctic region and strictly speaking only one species, *S. corollæ* seems to occur commonly in this country.

The species of *Syrphus* are beautiful flies and exquisite hoverers in the sunshine and our common species seems to occur every-where near plants and flowers in the desert as well as throughout the Nile valley. Verrall states that species of *Syrphus*

sometimes occur in great swarms amongst which he mentions *S. corollæ*, *Lasiophthicus pyrastri* and *S. balteatus*; they "appeared to have all hatched simultaneously, and to have at once commenced buzzing about in the sunshine in a foolish kind of way, without caring to take food, for most of them seemed to be mere shells without any substance inside"; the date of the occurrence of the two and only swarms is August 24th. This genus is one of the largest in the family and now includes about 350 species recorded from practically every part of the world.

TABLE OF EGYPTIAN SPECIES.

1 (2) Length of abdomen less than twice its breadth; abdominal spots very conspicuous, rather lunulate and extend over the side margins (Pl. IV, figs. 2, 3) .... **1 corollæ** FABR.

2 (1) Length of abdomen more than twice its breadth; abdominal spots do not reach the side margins.

3 (4) Abdominal bands duplicated (Pl. IV, fig. 6) **2 balteatus** DEG.

4 (3) Abdominal bands very emarginate, or separated into triangular spots, (Pl. IV, fig. 1) .. **3 auricollis** MEIG.

1. S. COROLLAE **FABR.** (Pl. IV. figs. 2, 3).

FABR., Entom. Syst., IV. 306.103. (1794) et Syst. Antl., 250.8. (*Scæva*). (1805); MEIG., Syst. Beschreib., III. 304.46. (1882); MACQ., Rec. Soc. Sci. Lille, 1828.239.23. (1829) Suit. à Buff., 1.539.18. (1834), (in WEBB et BERTH.): Hist. Nat. d'Iles Canar., Entom., Dipt., 109.49. (1838) et Explor. Scient. Algerie, Zool., III.469.170. (1849); WIED., Aussereurop. Zweifl. II. 121. 7. (1830); BRULLÉ, Expéd. Scient. de Morée, III. 1., 310.669. (1832); LW. Verh. zool.-bot. Ver. Wien., VII. 80.32. (1857), Programm. Posen, 1840.34.4 (1840) et Isis, 1840. VIII. 572.4. (1840); ZETT., Ins. Lappon., Dipt., 602.16. (*Scæva*) (1838), Dipt. Scand., II. 720.23. (*Scæva*) (1843). Dipt. Scand., VIII. 3138.23. (*Scæva*) (1849) et XII. 4657.23. (*Scæva*) (1855); WALK., List Dipt. Brit. Mus., III. 583. (1849) et Ins. Britann., Dipt., I. 289. 9. (1851); SCHIN., Verh. zool.-bot.

Ver. Wien. VII. 345. 31. (1857), Fauna Austr. Dipt., I. 306. 22. (1862) et Nov. Reise, Dipt., 353. 41. (1868). ROND., Dipterol. Prodr., II. 135. 20. (1857); BONDS., Finl. tvaving. Ins., I. 241. 20. (*Scæva*); PALMA, Annal. Accad. Asp. Nat. Nap., (3), III. 53. 67. (1863); MALM, Gœteb. Kongl. Vet. Handl., 1863. 31. (*Scæva*) (1863); WEYENB., Tijdschr. v. Entom. (2). IX. (XVIII). 155. t. IX. f. 17. (1876); KOW., Wien. Entom. Zeitg., IV. 136 et 168. (1885); NEUHAUS, Dipt. Marchica, 101. 10. (1886); STROBL, Mittheil. Naturwiss. Ver. Steiermark, XXIX. 1892. 169. (1893) et Wien. Entom. Zeitg., XII. 74. (1893); v.d. WULP, Catal. Dipt. South Asia, 118. (1896); COQUILL., Proc. Unit. Stat. Nat. Mus., XXI. 321. (1898); STROBL, Wien. Entom. Zeitg., XVIII. 146. 100. (1899) et Mem. R Soc. Espan. Hist. Nat., III. 327. (100). (1906); PLATEAU, Mém. Soc. Zool. France, 1900. 277. (1900); VERR., Brit. Fl., VIII. 381. 19. et Cat. Syrph., 60. (1901); BECK., Mitteil. Zool. Mus. Berl., II. 84. 119. (1903) et Zeitschr. f. System. Hym. u. Dipt., VII. 243. *Anmerk* (1907); VILLEN., Feuil. Jeun. Natur., XXXIII. 147. (1903); BEZ., Dipt. Syriaca et Ægypt., (21). 57. 94. (1903) et Ditt. Eritrei, II. 13. 38. (1908); BECK., BEZ., KERT. u. STEIN, Cat. Palaearkt. Dipt. III. 62. (1907); KERT., Catal. Dipteror., VII. 110. (1910) ; LUNDB., Dipt. Danica, V. 304-307, f. 121. 122. (1916).

SYNONYMY:—?pinastri DEC., Mem. p. serv. l'hist. d. Ins., VI. 113. b.t. VII. f. 1-7 (*Musca*) (1776).

consisto HARR., Expos. Engl. Ins. 112. t. XXIII. f. 56. (*Musca*) (1782).

vorax FOURER., Entom. Paris, II. 486. 49. (*Musca*) (1785); VILL., Entom. Linn., III. 539. 351. (*Musca*) (1789).

pyrorum SCHRANK, Faun. Boica, III. 114. 2430. (*Musca*) (1803).

olitoria FALL., Dipt. Suec., Syrph., 43. 12. (*Scæva*) (1817).

lacerus MEIG., Syst. Beschreib., III. 301. 41. (1822); SCHIN., Verh. zool.-bot Ver. Wien, VII. 345. 32. (1857).

fulvifrons MACQ., Rec. Soc. Sci. Lille, 1828. 240. 24. (1829) et Suit. à Buff., I. 540. 19. (1834); MEIG., Syst. Beschreib. VII. 132. 101. (1838); SCHIN., Verh. zool.-bot. Ver. Wien. VII. 346. 33. (1857); STROBL, Mittheil. Naturwiss. Ver. Steiermark, XXIX. 1892. 169. (1893), WIEN. Entom. Zeitg., XII. 74. (1893) et XVIII. 146. (1899).

?flaviventris MACQ., Rec. Soc. Sci. Lille, 1828. 240. 25. (1829) et Suit. à Buff., I. 540. 20. (1834); SCHIN., Verh. zool-bot. Ver. Wien, VII. 346. 34. (1857).

crenatus MACQ., Rec. Soc. Sci. Lille, 1828. 243. 29. (1829) et Suit. à Buff., I. 541. 23. (1843); MEIG., System. Beschreib., VII. 133. 104. (1838); SCHIN., Verh. zool.-bot. Ver. Wien, VII. 346. 37. (1857) et Fauna Austr. Dipt., I. 312. (1862); PALMA, Annal. Accad. Asp. Natur. Nap., (3). III. 54. 68. (1863); ROND., Atti. Soc. Ital. Sci. Nat. Milano, XI. 28. (1868).

?*terminalis* WIED., Aussereurop. zweifl., II. 135. 33. (1830); LW., Dipterenf. Südafr., I. 303. 1. (1860).

annularis CURT., Guide, Edit. II., 252. 13. (*Scæva*) (1837).

octomaculatus CURT., Guide, Edit. II., 252. 15. (*Scæva*) (1837).

?*disjunctus* MACQ., Dipt. Exot., II. 2., 88. 3. (1842) et Explor. Scient. Alger., Zool., III. 469. 171. (1849); LW., Dipterenf. Südafr., I. 303. 2. (1860).

topiarius WALK. (*nec.* MEIG.), List Dipt. Brit. Mus., III. 582. (1849) et Ins. Britann., Dipt., I. 290. 12. (1851).

propinquus MACQ., Dipt. Exot., suppl. 4., 150. 44. t. XIV. f. 8. (1849); BIG., Annal. Soc. Entom. France, (6) III. 316. (1883).

corotlæ ROND., Bull. Soc. Entom. Ital., IX. 61. (1877).

berber BIG., Annal. Soc. Ent. Fr. (6) IV. 87. 3. (1884).

Var. latifasciatus MACQ., Rec. Soc. Sci. Lille, 1828. 242. 28. (1829) et Suit. à Buff., I. 541. 22. (1834); MEIG., Syst. Beschreib., VII. 132. 103. (1838); SCHIN., Verh. zool.-bot. Ver. Wien, VII. 346. 35. (1857); VERR. Entom. Monthly Mag., V. 192. 10. (1868), IX. 253. 6. (1873) et Brit. Fl., VIII. 371. 15. f. 292. (1901); BEZ., Bull. Soc. Entom. Ital., XXXV. 14. (1903); LUNDB., Dipt. Danica, V. 302-304. (1916).

=*abbreviatus* ZETT., Dipt. Scand., VIII. 3136 13-14. (*Scæva*) (1849); OST-SACK., Proc. Boston Soc. Nat. Hist., XVIII. 114.4. (1875); WILLIST., Proc. Amer. Philos. Soc., XX. 313. (1882) et Bull. Unit. Stat. Nat. Mus., (31), 81. (1886); CHAGNON, Natur. Canad., 1901 (sep.) 33. 3. (1901); ALDR., Catal. N. Amer. Dipt. 364 (1905).

=*affinis* LW. Programm. Posen, 1840. 35. 11. (1840) et Isis, 1840. VIII. 574. 11. (1840); SCHIN., Verh. zool.-bot. Ver. Wien. VII. 342. 19. (1857); LW., Rocznik towarz. nauk. Krakow, P. 3. XIX. (XLII). 180. 24. (1871); STROBL, Mittheil. Naturwiss. Ver. Steiermark, XXIX. 1892. 167. (1893).

=*affinis* PALMA, Annal. Accad. Asp. Natur. Napoli. (3) III.

51. 64. t. fig. 5. (1863); Rond., Atti. Soc. Ital. Sci. Nat. Milano, XI. 26. (1868).

= *excisus* Schin., Fauna Austr., Dipt., I. 311. 42. *var.* (1862).

= *flaviceps* Rond., Dipterol. Prodr., II. 133. 18. (1857).

= *var. rufinasatus* Big., Annal Soc. Entom. Fr., (6) IV. 88. 4. (1884).

= *var. algirus* Macq., Explor. Scient. Alg., Zool. III. 469. 172. t. IV. fig. 11. (1849); Beck., Mitteil. Zool. Mus. Berl., II. 84. 120. (1903); Verr., Brit. Fl., VIII., Cat. Syrph., 61. (1901).

DIAGNOSIS:—Length of abdomen more than twice its breadth; abdominal bands very conspicuous, always separated into lunules in the female, though often connected in the male and which extend over the side margins. Male with very large genitalia.

DESCRIPTION:—*Male:* Face and frons entirely orange-yellow, but from the front mouth-edge there is a blackish line running about half way up the face, which becomes gradually narrow and brownish above and then dies out; the jowls are also blackish. The pubescence on the upper part of the frons is black and conspicuous down to below the antennæ at the sides, but a large space above and immediately below the antennæ is quite bare; lower down the hairs on the sides of the face are very pale and inconspicuous; the pubescence on the jowls and on the lower part of the occiput is yellowish or almost white, but it becomes darker, almost orange on the upper part, and with no black hairs overhanging the eyes. Vertex black and possessing black hairs. Eyes quite bare. Antennæ dark brown, but brownish-orange on the ventral surface, which colour is often restricted to the base of the third joint, but sometimes it is extended below, on the sides and above, so that the antennæ appear reddish-brown; arista rather short, brownish-orange and situated on the oval third joint, at a point about one-third of its length from the base. Thorax moderately shining æneous-black; its pubescence is fairly dense and entirely tawny or yellow; scutellum brownish-yellow with entirely yellow pubescence. Abdomen ovate, about as long as the head and thorax, but rather flat, and wider than the head and thorax; it is dull black except at the base, apex, side margins, and on the hind-margin of the fourth segment, where it is shining; there are three pairs of orange markings, often varying greatly in size, followed by two orange hind margins; the markings on the second segment are the smallest, sloping slightly downwards, widely separated and connected at their highest point with the side margins; the

second pair (on the third segment) are deep, generally the deepest, and rather lunulate, their inner ends being very close to the front margin, while their outer front ends, which are connected narrowly with the side margins, are some distance from the front margin; these lunules are rather flat below and very commonly either faintly or distinctly connected at about their middles, sometimes forming a broad orange band; the third pair of markings (on the fourth segment) are somewhat similar to the second, but their inner ends, opposite the front margin are wider and their lower sides slope upwards, but they are also liable to great variation ; the lower margin of the fourth segment is orange ; the fifth segment is almost entirely orange except for an obscure black line along the middle of its base, which at times is scarcely visible and sometimes thickened into a dark blotch. The pubescence on the abdomen is long and yellow about the basal corners, whitish on the large genitalia, but elsewhere short and rather inconspicuous, mainly following the ground colour, except for some pale hairs on the black disc of the basal segment; the marginal hairs, after the base are all black even where the yellow markings extend over the side margins. Venter with the basal orange markings seen by transparency, but are vaguely more extended. Hypopygium very large, with the big knob shining æneous-black, but the lower knob usually dark orange, although in some rare cases it may also be black.

Legs orange, but the basal half of the anterior femora and the basal two-thirds of the hind femora and the tarsi are brown above. Pubescence on femora moderate, mainly pale after the front pair, but with a slight black fringe behind, on the yellow portion, which fringe is more conspicuous on the middle femora, which otherwise have their longer pubescence pale ; the hind femora are covered with minute black bristles and possess very few hairs ; there are also some minute black bristles on the hind tibiæ, except about the inner side of the apex.

Wings rather broad, pellucid, but blackish at the extreme base, then yellowish, with the stigma usually even darker. Squamulæ whitish-yellow, with yellower margins and fringes. Halteres yellow.

Female:—Similar to most males, but the yellow abdominal markings are much smaller and always well separated ; they are more lunulate on their upper edge and more widely connected with the side margins ; the fifth segment usually has broad orange sides, which are connected with a narrow orange hind margin, hence leaving only the middle black. Frons shining black on the upper third, with a somewhat indefinite lower limit, which is sometimes vaguely prolonged ; there are often a pair of small dark lunules

just above the antennæ. Legs orange, except the extreme base of the anterior femora.

Length from 8 to 12 mm.

S. corollæ is one of the commonest Egyptian species of this family and occurs all over Egypt. My records extend from the end of August to June. It is known to occur all over North Africa, Europe, Asia Minor and North Asia, Madeira, Canary Islands, China, Japan and South America.

2. **S. BALTEATUS DEG.** (Pl. IV. fig. 6 male).

DEG., Mém. pour serv. l'hist. d. Ins., VI.116.7. (*Musca*) (1776); VILL., Entom. Linn., III. 454.111. (*Musca*) (1789) ; MEIG., System. Beschreib., III. 312.57. (1822); MACQ., Rec. Soc. Sci. Lille, 1828. 249.38. (1829), Suit. à Buff., I. 538.11. (1834) et Explor. scient. Algérie, Zool., III. 469.169. (1847); BRULLÉ, Expéd. sci. Morée, III. 1., 310.670. (1832) ; BOUCHÉ, Naturgesch. d. Ins., I.50.33. t. V. f. 1-3 (1834) ; VALLOT, Annal. Soc. Entom. Fr., III. Bull., LXV. (1834); LW. Programm. Posen, 1840.34.5. (1840), Isis, 1840. VIII. 572.5. (1840) et Verh. zool.-bot. Ver. Wien., VII. 80.38. (1857) ; BLANCH., Hist. Nat. Ins., III. 600. t. IV. f. 2. (1840) ; ZETT., Dipt. Scand., II. 721. 24. (*Scæva*) (1843) et VIII. 3139. 24. (*Scæva*) (1849); ROND., Nuov. Annal. Sci. Nat. Bologna, (2). VIII. 341. *nota.* (1847), Dipterol. Prodr., II. 132. 13. (1857) et Bull. Soc. Entom. Ital., IX. 61. (*baltheatus*) (1877); WALK., List Dipt. Brit. Mus. III, 582. (1849) et Ins. Britann., Dipt., I. 289. 10. (1851); SCHIN., Verh. zool.-bot. Ver. Wien, VII. 350. 50. (1857), Fauna Austr. Dipt., I. 309. (1862) et Nov. Reise, Dipt., 353.42. (1868) ; CURT., Farm. Ins., 82. (1860); BONDS., Finl. tvaving. Ins., I. 241. 21. (*Scæva*) (1861); MALM., Goeteb. Kongl. Vet. Handl., 1863.32. (*Scæva*) (1863) ; WEIJENB., Tijdschr. v. Entom., (2) IX. (XVII). 155. (1874); v. d. WULP, Sumatra Expéd., Dipt., 33.5. (1881) et Catal. Dipt. South Asia, 118. (1896) ; KOW., Wien. Entom. Zeitg., IV. 135. (1885) ; NEUHAUS, Dipt. Marchica, 102.17. (1886) ; BECK., Berlin. Entom. Zeitschr., XXXIII. 175.161. (1889) ; GRIFF., Bull. Mus. Zool. e. Anat. comp. Torino, VIII. N° 143.7. (1893); STROBL., Mitteil. Naturwiss. Ver. Steiermark, XXIX. 1892.166. (1893); MIK., Wien. Entom. Zeitg. XVII. 169.84. (1898) ; COQUILL., Proc. Unit. Stat. Nat. Mus., XXI. 322. (1898); PLATEAU, Mém. Soc. Zool. Fr. XIII. 278. (1900); VERR., Brit. Fl., VIII. 390.22. f. 302. (1901) ; MEIJ., Zoolog. Jahrb., Abth. Anat., XV. 679.

t. XXXIV. f. 46-47. (1902); ANDREWS, Entomol. Record., XV. 81. *var.* (1903); BRUNETTI, Records Indian Mus., I. 169. (1907); LUNDB., Dipt. Danica, V. 316-318 (1916).

SYNONYMY:—*cannabinus* SCOP., Entom. Carn., 344.929. (*Musca*) (1763) ; PETAGNA, Spec. Ins. ultr. Calabr., 43.230. (*Musca*) (1786); GMEL., Syst. Nat., V. 2864. 113. (*Musca*) (1790); OLIV., Encycl. Méthod., VIII. 45.215. (*Musca*) (1811); SCHIN., Verh. zool.-bot. Ver. Wien, VI. 415. 929. (1856) et VII. 448. (1857).

alternatus SCHRANK, Enum. Ins. Austr., 448.903. (*Musca*) (1781); GMEL., Syst. Nat., V. 2880. 384. (*Musca*) (1790) ; ROSSI, Fauna Etr., II. 297.1483 (1790) et Edit. II. 457.1483. (1807) ; SCHRANK, Fauna Boica, III. 109.2417. (*Musca*) (1803).

scitule HARRIS, Expos. Engl. Ins., III. t. XXXIII. f. 35. (*Musca*) (1782).

scitulus HARRIS, Expos. Engl. Ins., 105. t. XXXII. f. 33. (*Musca*) (1782).

nectareus FABR., Mantissa Insect., II. 341.74. (1787) et Ent. Syst., IV. 309.116. (1794); PANZ., Fauna Germ. LXXXII. t. 19. (1801) ; SCHELLENB., Gattung. d. Flieg., 52 et 53. t. X. f. 2. (1803); FABR., Syst. Antl., 253.22. (*Scæva*) (1805); FALL., Dipt. Suec., Syrph., 43.14. (*Scæva*) (1817).

nectarinus GMEL., Syst. Nat., V. 2876.365. (*Musca*) (1790).

viridaureus WIED., Analecta Entomol., 35.56. (1824) et Aussereurop. Zweifl., II. 137.37. (1830); v. d. WULP, Catal. Dipt. South Asia, 119. (1896).

triligatus WALK., Proc. Linn. Soc. Lond., I. 19.65. (1856) ; v. d. WULP., Catal. Dipt. South Asia, 119. (1896).

var: alternans MACQ., Dipt. Exot., II. 2., 89.7. (1842) et Suppl. 4., 149. (1849) ; WALK., List Dipt. Brit. Mus., III. 583. (1849) et Proc. Linn. Soc. Lond., I. 124.107. (1856).

var: nectarinus WIED., Aussereurop. Zweifl., II.128.21. (1830); OST.-SACK., Annal. Mus. Civ. Genova, XVI. 438. (1882).

var: andalusiacus STROBL, Wien. Entom. Zeitg., XVIII. 145. 99. (1899).

DIAGNOSIS:—Length of abdomen nearly three times its breadth ; abdomen with almost parallel sides ; abdominal bands duplicated and do not reach the side margin.

DESCRIPTION:—Male "Face orange, bearing grey dust and "a slight pale pubescence; jowls usually tinged with black, but "often on only the separating off space near the lower front corner "of the eye ; there are no long black hairs overhanging the eyes "on their upper part; the vertex is dusted æneous, narrow and pale "haired on at any rate its front part. Frons often more or less "greyish black and dusted on its upper part, but shining orange "just above the antennæ ; its pubescence is black and fairly long. "Antennæ orange, often with the upper part or even more of the "third point brownish or even brownish-black ; arista varying from "yellowish brown to black.

"Thorax shining æneous with three faint pale greyish lines "on the fore part, the middle line narrow and the other two broad; "the pubescence is erect, tolerably abundant but not conspicuous, "all yellowish. Scutellum with longer, almost all black, pubescence. "Abdomen almost linear, but slightly broadest about the end of the "second segment; the second segment has the yellow basal corners "connected along the sides with the broad pair of yellow spots on "the disc ; the third and fourth segments have the entire fore "margin yellow as well as a broad middle band, thus leaving the "entire hind margin black as well as a narrow line near the base "which does not reach the side-margins, the broad yellow band is "at its middle slightly produced in front and slightly emarginate "behind ; the fifth segment is all orange except a basal middle "black spot. Pubescence mainly the same as the ground colour but "there are a few black bristles down the middle and on the orange "part of the fourth segment. Genitalia orange and black.

"Legs long and thin, all orange except the blackish coxæ and "trochanters and the rather obscurely orange hind tarsi ; pubes-"cence moderate, the long hairs on the femora yellow except usually "a few blackish hairs behind the middle femora after the middle, "and in front of the hind femora near the tip ; the tiny bristles "about the tip of the middle femora, and in front of and all about "the tip of the hind femora are black, as are also usually all those "down the top and front of the hind tibiæ, which almost forms a "ciliation down the front of the tibiæ ; the basal joints of the hind "tarsi long and thin.

"Wings slightly brownish, with the subcostal cell and stigma "distinctly darkened ; Radius 4 + 5 very nearly straight. Squamulæ "yellow. Halteres orange.

Female. — "Similar but the orange markings are usually less "extensive and those on the front margin of the third and fourth "segments are somewhat contracted about the middle, and the black "line which follows extends over the side-margins, while the black

"hind margin is broader; these distinctions are however variable, as I "have seen females quite as orange as an ordinary male, while on "the other hand I have seen a female from Bigot's collection labelled "Corsica" in which the middle bands were devided into side spots.

"Pubescence shorter, and more black on the abdomen. Frons "narrow but gradually widening down to the base of the antennæ, "and it is greyish-yellow with an idefinite dark middle line, but "shining orange above the antennæ, while the ocellar triangle is "almost shining black. Antennæ often almost all brown.

"Length about 10 mm.

"The metamorphoses of this species have been often observed "and Zetterstedt states that the larva feeds on the Aphids of the "common Bean (*Faba*) and Potatoe (*Solanum esculentum*); Mr. G. "C. Bignell has bred it from *Aphis pruni;* Mik has dealt with it "at some length in Wien. Entom. Zeitg. XVII. p. 169. (1898)."

As I possess only a single specimen of this species the above account has been copied from Verrall's excellent description. This individual, a male, measuring over 12 mm. in length was caught by Mr. Kirkpatrick at Giza, December 2nd, 1921, where it was found hovering in a field of clover.

This specimen agrees with Verrall's description, except for the second segment of the abdomen in which the orange is much less extensive; in fact the whole of the second segment is rather shining black, except for two isolated and elongate orange spots on the sides, (Plate IV, fig. 6).

As far as I am aware this is the first record of the occurence of *S. balteatus* in Egypt but it is known to occur in other parts of North Africa, (e.g. Morocco).

It has also been recorded from Asia, India, Australia, Spain, China, Japan, Ternate and is common throughout Europe.

3. S. AURICOLLIS **MEIG.** (Pl. IV. fig. 1 female).

Meig., Syst. Beschreib., III. 318. 64. (1822); Macq., Suit. à Buff., I. 535. 2. (1834); Zett., Dipt. Scand., II. 743. 26. (*Scæva*) (1843); Walk., List Dipt. Brit. Mus., III. 584. (1849), et Ins. Britann., Dipt., I. 293. 22. (1851); Schin., Verh. zool.-bot. Ver. Wien., VII. 354.66. (1857) et Fauna Austr., Dipt., I. 311.44. (1862); Rond., Dipterol. Prodr., II. 132. (1857); Egg., Verh. zool.-bot. Ges. Wien, X. 666. (1860); Bonds., Finl. tvaving. Ins., I. 241.41. (*Scæva*) (1861); Malm., Gœteb. Kongl. Vet. Handl., 1863.40. (*Scæva*) (1863); Kow., Wien. Entom. Zeitg., IV. 136. (1885);

NEUHAUS, Dipt. Marchica, 115.28. (1886); STROBL., Mittheil. Naturwiss. Ver. Steiermark, XXIX. 1892.168. (1893); VERR., Brit. Fl., VIII. 397.25 f. 303. (1901); LUNDB., Dipt. Danica, V. 323-325 (1916).

SYNONYMY:—umbellatarum, var. FALL., Dipt. Suec., Syrph., 44.15. (*Scæva*) (1817).

decorus MEIG., System. Beschreib., III. 319.36. (1822); MACQ., Rec. Soc. Sci. Lille, 1828. 237.20. (1829), Suit. à Buff., I. 542.28. (1834) et in WEBB et BERTH. Hist. Nat. d'iles Canar., Entom., Dipt., 109. 50. (1838); WALK., Ins. Britann., Dipt., I. 292. 20. (1851); SCHIN., Verh. zool.-bot. Ver. Wien. VII. 352.56. (1857) et Fauna Austr., Dipt., I 308.29. (1862); ROND., Dipterol. Prodr., II. 131.10. (1857); NEUHAUS., Dipt. Marchica, 115.31. (1886).

Iris MEIG., System. Beschreib., III. 320.67. (1822); ZETT., Dipt. Scand., II. 761. (*Scæva*) (1843).

modestus MEIG., System. Beschreib., III.323.72. (1822); SCHIN., Verh. zool.-bot. Ver. Wien, VII. 353.60 (1857) et Fauna Austr., Dipt., 5. 311.43. (1862); EGG., Verh. zool.-bot. Ges. Wien, X. 666. (1860).

maculicornis ZETT., Dipt. Scand., II. 736.38. (*Scæva*) (1843) et VIII. 3142.38 (*Scæva*) (1849); SCHIN., Verh. zool.-bot. Ver. Wien, VII. 352.54. (1857) et Fauna Austr., Dipt., I. 308. (1862); ROND., Dipterol. Prodr., II. 151.8. (1857); BONDS., Finl. tvaving. Ins., I. 246.35. (1861); MALM., Gœteb. Kongl. Vet. Handl., 1863.38. (*Scæva*) (1863); VERR., Entom. Monthly Mag., V. 7. (1868); KOW., Wien. Entom. Zeitg., IV. 136. (1885); NEUHAUS, Dipt. Marchica, 115.29. (1886); BECK., Berlin. Entom. Zeitschr., XXXIII. 175.167. (1889); STROBL, Mittheil. Naturwiss. Ver. Steiermark, XXIX. 1892.170. (1893) et Wien. Entom. Zeitg., XVIII. 146.101. (1899); BECK., Zeitschr. f. system. Hymen. u. Dipt., VII. 243. *Anmerk.* (1907).

macilentus MEIG., System. Beschreib., VII. 135.109. (1838); SCHIN., Verh. zool.-bot. Ver. Wien, VII. 355.72. (1857).

cinctipes ZETT., Dipt. Scand., XIII. 6000.46-47. (*Scæva*) (1859).

?fuscus PALMA, Annal. Accad. Aspir. Natur. Nap., (3). III. 55. 79. t., f. 7. (1867); ROND., Atti. Soc. Ital. Sci. Nat. Milano, XI. 27. (1868).

var. nigritibius ROND., Dipterol. Prodr., II. 130.7. (1857); VERR., Brit. Fl., VIII. 399. (1901); VILLEN., Feuil. Jeun. Natural., XXXIII. 147. (1903).

DIAGNOSIS:—Length of abdomen more than twice its breadth; abdominal bands very emarginate, or separated into triangular spots which never reach the side margins.

DESCRIPTION:—Male. "Face and frons covered with dull "yellow dust, which leaves the central knob shining and usually "darkened from orange up to blackish, and downwards from this "the face is often darkened to the mouth and the lowest part; the "front of the frons just above the antennæ is also shining, being "luteous between and immediately above the antennæ, and blackish "above that; the pubescence of the frons is all black and is also "inconspicuously so down the sides of the face, but pale yellow on "the lower part of the face, on the jowls and on the back of the "head; on the upper part of the back of the head there are some "longer black hairs overhanging the eyes ; vertex shining black "and black haired. Antennæ reddish orange with the third joint "black except for a large reddish-orange spot beneath its base ; "arista brown and bare.

"Thorax very shining æneous black, humeri and pleuræ dull; "pubescence pale brownish to yellow. Scutellum æneous yellow with "longer black pubescence.

"Abdomen rather dull black but shining at the tip, narrower "that the thorax and with parallel sides; the *second segment with "a pair of* fairly large triangular *spots running up from near the "lower side-margins* towards the middle of the disc and growing "broader as they ascend, but leaving about the middle sixth of the "segment black; the third segment with a pair of spots (or a band "near the front margin) which do not touch the front or the side-"margins, but are really a pair of large orange spots which are "wider at the sides than at the middle and which are almost ex-"tended to the side-margins at their lowest side edge, and sloping "upwards, thence on their lower margin leave just the middle of "the segment all black (=var *maculicornis*), or with the spots "united on their upper part; the fourth segment has fairly similar "spots and its hind margin is all orange and united with very "large orange spots at the basal corners of the fifth segment, "which leaves only the triangular middle half of that segment "black. The abdomen is often less orange, especially on the fourth "and fifth segments. Pubescence pale yellow and long about the "base at the basal portion, but all black after the yellow spots on "the third segment, except for a few yellow hairs at the sides "about the base, or on the yellow spots, of the fourth segment. "Genitalia moderate, mostly orange. Legs varying remarkably from "simply all pale brownish-yellow with indications of darker color-"ing on the third femora, to the hind legs being not uncommonly

"blackish-brown with just the base and the tip of the femora and "the basal third of the tibiæ reddish-orange. Pubescence behind "the femora not scarce, black on the anterior femora but pale "near the base in pale specimens, on the hind femora pale yellow "beneath and in front; the tiny bristles on the hind legs are all "black about the tip of the femora and on all the tibiæ except the "usual yellow patch inside the hind pair about the tip."

"Wings pellucid, subcostal cell and stigma distinctly brown-"ish. Squamæ dull yellow, with brownish orange margins. Halteres "brownish yellow."

Female:—"Similar; frons glittering blue-black at the vertex, "then all covered with yellow dust but sometimes with an in-"distinct middle black line connecting the vertex with a large shin-"ing space above the antennæ which space ranges from shestnut "to black; the pubescence of the frons is all black, but on the face "it is all pale, and there is scarcely any dark middle line, while it "is all orange right away to the jowls; the hairs on the back of "the head are dense and conspicuously white, but yellow on the "upper part; the pubescence on the thorax is short, but on the "scutellum short on the disc only, the hairs round the margin being "fairly long. Legs very variable as in the male, from a normal "form which would have them all dull orange except for a black "ring about the middle of the hind femora, to specimens in which "this ring is considerably extended and the hind tibiæ and tarsi "become almost all blackish, and even until the front femora be-"come extensively darkened."

"Length about 10 mm."

"Mr. G.C. Bignell bred it from larvæ which fed on *Aphis* "*pruni*, and *S. auricollis* seems to be the main species to be stored "up by *Crabro varus* to provide food for its larvæ, as in its bur-"rows there occur masses of *S. auricollis* (4 males, 3 females) with "their heads all pointing in one direction, while a pair of *S.* "*balteatus* occurred in company."

Here again I only posses a single specimen of this interesting species and therefore I can do nothing better than give Verrall's description of it above in detail. This individual, a female, was caught in my garden at Shoubra on December 20th, 1921, where it was resting on a rose shrub. My specimen seems to agree with the darkest forms of this extremely variable species, mentioned by Verrall and its dark central knob, blackish antennæ and arista, very dark abdomen with its very obscurely luteous spots (Plate I fig. 4), and its remarkably blackish legs makes it almost identical with Rondani's *S. nigritibius.*

The capture of this specimen does not greatly surprise me, although this species has never yet been recorded from Egypt. Like all the members of its genus, the larva of *S. auricollis* is aphidephagous in habit, and commonly feeds on the aphids attacking rose trees. As these are continually being imported into this country from various parts of Europe, it is to be expected that this and other species of similar habits may be introduced occasionally in the form of pupæ attached to the plant stems, etc. As a matter of fact the individual in question may represent such a case as during the past few years we have been continually receiving large consignments of plants including roses, for the garden.

6. PSEUDODOROS BECK.

BECK., Mitteil. Zool. Mus. Berl., II. 92. (1903).

This genus is rather closely allied to the genus *Baccha* FABR. and still more so to the genera *Doros* MACQ., and *Spazigaster* ROND. It also possesses several characters in common with the genus *Syrphus*, such as the venation of wings, and the head. The body is practically identical to that of *Doros* whilst the legs remind one of *Baccha*.

Becker gives the following table in order to clearly exhibit the characters of this interesting genus:—

	BACCHA	DOROS	PSEUDODOROS	SPAZIGASTER
(1)	Sides of thorax devoid of hairs.	Sides of thorax devoid of hairs.	Sides of thorax hairy.	Sides of thorax devoid of hairs.
(2)	Third joint of antennæ short and oval	Third joint of antennæ short and oval.	Third joint of antennæ longish and oval.	Third joint of antennæ short and oval.
(3)	Arista bare, inserted near the base.	Arista bare, inserted near the base.	Arista bare inserted just before the middle.	Arista hairy, inserted near the base
(4)	Face not projecting.	Face projecting.	Face not projecting	Face a little projecting
(5)	Prominence of face wart-shaped	Prominence of face wart-shaped.	Prominence of face nose-shaped as in *Syrphus*	Prominence of face nose-shaped as in *Syrphus*
(6)	Abdomen stalk-shaped, very slender.	Abdomen robust, club-shaped.	Abdomen club-shaped but much more slender than in *Doros*.	Abdomen flattened narrow at base
(7)	Hind femora straight, without thickening at base.	Hind femora straight, with a slight thickening at base	Hind femora curved, without thickening at base	Hind femora slender, straight, without thickening at base

1. P. NIGRICOLLIS BECK. (Pl. VI, fig. 5).

BECK., Mitteil. Zool. Mus. Berl., II. 92. 128. (1903).

DESCRIPTION:—Male: Face and frons yellowish-white except for two fairly shining black spots at the base of the antennæ, which run down the centre of the face, and extend to the upper mouth-edge; pubescence of face and frons uniformly pale, short,

and inconspicuous, while that on the upper part of the occiput rather longish and yellow, but on the lower part whitish. Vertex rather shining black; a little protruding and very pointed in front, and possesses a few pale, very inconspicuous hairs. Eyes fairly large, quite bare, and meet for a distance which is about equal to the length of the frons. Antennæ rather porrected, with the first and second segments very short and the third elongate and oval; it is three times as long as deep, black but with white and grey sheens; this third joint bears just before its middle a short, black and bare arista.

Thorax blackish-æneous with steel-blue iridescence; its pubescence is very delicate, pale yellow, fairly long and conspicuous; the pleuræ also possess very similar pubescence except for a tuft of much longer hairs on the mesopleuræ. Scutellum very shining bronze green with very pale, short and inconspicuous pubescence on the disc, but with a few much longer, delicate, pale and radiating hairs on the side and lower margins. Abdomen rather shining black with three pairs of yellow markings. The first and second segments are very shining steel-blue, but the second possesses in the middle of the sides two small oval yellow markings, and the basal margin of this segment is dull black. The two oval yellow markings on the third segment are a little nearer the basal margin, whilst the pair on the fourth segment, which is very inflated on its apical end, are situated quite close to the basal margin. The fifth segment is very short, also shining black with its apical end yellow. The pubescence on the two basal segments is very delicate, long and whitish; the hairs somewhat tend to diverge and are rather tawny and woolly; the pubescence on the last three segments is very short blackish and adpressed. The small hypopygium is yellow and ball-shaped and its upper part is clothed with black hairs.

Legs yellow and black; the two anterior femora with their basal halves black and the tibiæ are entirely yellow except for a narrow black ring near the middle; the last three joints of the tarsi are also blackish and the two basal joints of the tarsi yellow. The posterior femora are black except for a small yellow spot near the base and they are decidedly bent at the apex; the posterior tibiæ and tarsi are also black, except for the basal half of the tibiæ yellow; the tarsi are slightly longer than their tibiæ; the hind metatarsi are long and rather slender and nearly as long as the other four joints together.

Wings pellucid, feebly clouded with yellowish-grey with the stigma brownish; Radius 4 + 5 is but very feebly looped. Squamulæ white. Halteres yellow.

Length 11 to 12 mm.

This curious and interesting insect seems to be extremely rare, the only two specimens, both males, which I know, were bred from larvæ captured at Ghezireh by Mr. F.A. Willcocks. One is in my collection labelled "feeding on *Aphis pruni* on reed-grass, Ghezireh, spring 1909" and the other in the collection of the Sultania Agricultural Society labelled "bred from Banana plant, Ghezireh".

The female has not been described and is so far unknown.

ERISTALINÆ

Antennæ moderate in shape and length, drooping; arista dorsal and always bare in the Egyptian species.

Wings with the radio-median cross-vein at, or after, the middle of cell M2; Radius 4+5 with a deep sudden loop downwards at about the middle of cell R5; cell R1 either closed or open. Legs usually simple, but the hind femora sometimes thickened and curved, with a dilatation just before the apex.

Many of the members of this sub-family (especially the European and Exotic genera) seem to mimic bees and all may be known by the peculiar loop in the cubital vein. The metamorphoses of many European species have been studied and nearly all approximate to the well known "rat-tailed" larva of *Eristalis tenax*. These live in liquid mud or filth and the long anal process can be extended or diminished by the larva according to the varying depth of the liquid in which it exists. I have found the larvæ of *Eristalis* in various stagnant ponds near Cairo in company with the rather familiar and similar larva of *Hirtea anubis* (Stratiomiidæ).

I have also watched the adults of E. *tæniops* and *æneus* hovering and resting over the edges of these ponds and in all probability they were ovipositing. I have further found larvæ of *Eristalis* in a water tank containing macerated bones, at the School of Medicine, in conjunction with *Psychodid* and *Culicid* larvæ and have watched the female of *E. tæniops* hovering over this tank and ovipositing in the moist chinks and cracks of the floating bones.

The only representatives of this sub-family in Egypt belong to the two great genera *Eristalis* and *Helophilus* which contain most of the species and which are represented all over the world. However the true *Helophilus* does not seem to be represented here (nor apparently in North Africa) but those that do occur belong mainly to the Sub-Genus *Mesembrius*.

TABLE OF THE EGYPTIAN GENERA OF ERISTALINAE.

I (ii) Cell R1 closed; eyes hairy, face with a central knob .... ERISTALIS

1 (2) *Arista plumose or distinctly pilose.... *Eristalis*

2 (1) Arista bare or very shortly pubescent.

3 (4) Face unicolorous .... *Eristalomyia*

4 (3) Eyes with markings.

5 (6) Eyes with 5 obscure transverse stripes.. *Eristalodes*

6 (5) Eyes with obscure spots which are separated or confluent.

7 (8) Eyes practically touching on the frons in the male .... *Lathyrophthalmus*

8 (7) *Eyes well separated on the frons in the male .... *Eristalinus*

II (i) Cell R1 open; eyes bare.............. HELOPHILUS

Eyes of male just touching............ *Mesembrius*

Not represented in Egypt.

7. ERISTALIS LATR.

LATR., Hist. Nat. Crust. Ins., III. (1802) et XIV. 363. (1804).

SYNONYMY:—Palpada MACQ., Suit. à Buff., I. 512. 19. (1834).

Priomerus MACQ., Suit. à Buff., I. 511. 18. (1834).

Syrphus ZETT. (*nec.* Fabr.), Ins. Lappon., Dipt., 591. 52. (1838)

Eristalinus ROND., Nuov. Annal. Sci. Nat. Bol. (2). II. 453. I. (1844).

Eristaloides ROND., Nuov. Annal. Sci. Nat. Bol., (2) II. 453. 3. (1844).

Dolichomerus MACQ., Dipt. Exot., suppl. 4., 131. (1849).

Eristalomyia ROND., Dipterol. Prodr., II. 38. 2. *nota* (*Eristalomya*) (1857).

Simoides LW., Œfv. Vet. Akad. Forh., XIV. 382. 14. (1858).

Eriops LIOY, Atti. Inst. Veneto, (3). IX. 743. 1. (1864).

Doliosyrphus BIG., Annal. Soc. Ent. Fr., (6). II., CXX. (1882).

Dolyosyrphus BIG., Annal. Soc. Ent. Fr., (6). III. 228. (1883).

Eristalodes MIK, Wien. Entom. Zeitg., XVI. 114. (1897).

Lathyrophthalmus MIK, Wien. Entom. Zeitg., XVI. 114. (1897).

Large or rather large bee-like flies, which are distinguished from all other Egyptian Genera by the peculiar venation of the radial and cubital veins.

Head moderate or rather large; face with a distinct central knob and a moderately produced upper mouth edge, this latter being more or less descending. The central knob is always left shining black, clear of the pale dust and pubescence which cover and obscure all the sides of the face and most of the frons. Face always separated from the jowls by clear bright black spaces. Frons not conspicuously produced and always distinctly pubescent. Eyes always touching in the male, sometimes spotted and always hairy;

generally the hairs are found on a limited space of the upper part, except in *E. tenax*, where the hairs are much more numerous and arranged in denser lines. Antennæ moderate in shape and length, the third joint always bearing near its base a bare arista. Thorax quadrate, in some species bearing fairly conspicuous light markings, and in others quite faint ones; it is more or less densely pilose all over, without any trace of bristly hairs. Scutellum equally pilose with the thorax and usually yellowish and translucent (except in *E. æneus*).

Abdomen moderate in shape, ranging in colour from a uniform æneous-black to being largely covered with orange, white and black markings; it varies in shape and in pilosity with different species. Legs almost simple in construction but with the hind tibiæ nearly always curved and with variable ciliation. Wings specialised by the closed R1 cell and by the deep loop in Radius 4+5 over the middle of cell R5, these characters distinguishing them from the wings of any other Egyptian Diptera.

SYNONYMY:—In 1857 Rondani separated off the European species with a plumose arista into a limited genus *Eristalis*, after which the species with a bare or almost bare arista have been broken up into various subgenera. Rondani, who made the first attempt, suggested *Eristalomyia* for the species which have the eyes touching in the male and thus created a genus *Eristalinus* for a single species (*E. sepulchralis*) in which the eyes are well separated in the male. This induced Mik in 1897 to further subdivide the genus. He suggested that the species with a bare arista should be separated into 4 genera of which the first should be *Eristalomyia* with its type *E. tenax*, which has the eyes unicolorous. As Verrall states, it was unfortunate for his generic distinction that *E. tenax* has two bands of darker pubescence running down its eyes, which form its most distinctive specific character; Verrall further admits that these bands are caused by pubescence and are longitudinal, so that they do not traverse the generic or subgeneric rank. After *Eristalis*, Mik separated off the species with what he called "oculi picti" which one would translate as "eyes with markings," and on this basis he formed a genus *Eristalodes*, in which the eyes have five obscure transverse stripes, and a genus *Lathyrophthalmus* which is distinguished from Rondani's *Eristalinus* simply because the eyes of the male approximate in *Lathyrophthalmus* and do not approximate in *Eristalinus*.

Moreover the species of this genus all show a close relationship to each other in their stout solid shape (even in the very numerous European species), so that no confusion should arise as to their position in this family and I cannot help agreeing with

Verrall who considers that all attempts to split up the European or Palæarctic species into distinct genera have been failures.

DESCRIPTION:—The larva, as described by Lundbeck has a cylindrical body, a little attenuated behind before it goes over into the long, thin, tail-shaped part; the body consists of twelve segments, the head included, this latter being small and retracted; above the mouth opening are two small, two-jointed organs, the antenna-like papillæ or so-called antennæ, the last joint bearing two small papillæ; there are no mouth-hooks but a pharyngeal skeleton; at each side of the mouth below is a small wart with spines. The body is somewhat transversely corrugated above, and the prothoracal segment has some longitudinal furrows. The dermis is tough and densely beset with small spinules; besides these clothing spinules there are above on the corrugations some rather larger spines or small warts but they are very slightly pronounced; they are present in the same number and arranged quite in the same way as in other Syrphid larvæ so that there are some on the prothoracal segment, a transverse row of six on the second and third thoracal segments and on the first abdominal segment; on the other segments there are two in the middle on one corrugation and two towards each side on the next corrugation; on the sides there are three on each segment and one quite below on the ventral surface. On the ventral side there are a pair of proleg-like warts, beset with spines, on the prothoracal segment, and then six pairs of prolegs on the six first abdominal segments; these are beset with curved spines at the end, especially along the hind margin. The last segment terminates in the long tail-shaped part with the posterior spiracular tube which is telescopically pro-and retractile and able to be stretched out to a very great length. The tail consists of three divisions, the foremost is a prolongation of the last segment; it is transversely wrinkled and like the other dermis beset with fine spines; at the sides of it are four small bunches of hairs at intervals, one at each side at the base, one at the apex and two intermediate, but the distances between them are dependent on the contractions; the next division is thinner, longitudinally striated and with fine, nearly microscopical spines in rows; finally the third division is still thinner, more firmly chitinized and brown; it is very finely transversely striated, the end part smooth, and it bears at the apex the spiracles surrounded by eight plumose hairs. The length of the three divisions are dependent on the degree of extension, only when fully extended, they are seen in full length, and when fully retracted the intermediate part is quite hidden in the basal division and only the end of the third part is seen protruding from the first or basal part, and also this latter part may be somewhat

contracted. At the hind margin of the prothoracal segment lie the anterior spiracles; they form short, brownish, a little curved horns, but they may be quite retracted and then only seen as points. Above, on the first abdominal segment two somewhat circular spots are seen: these are the points through which the anterior spiracular tubes in the pupa protrude.

The anus lies below in front of the tail; protruding from its opening is sometimes seen a bundle of thread-like appendices, the use of which is not known; Trybom takes them to be an organ of locomotion, perhaps also of respiration. The larva is of a greyish or yellowish-white colour and about 18 mm. in length excluding the tail. The pupa is brownish, its upper anterior end forms a flattened declivity, at the hinder border of which the anterior spiracular tubes protrude; these tubes are long, reaching 3 mm., a little curved, directed upwards and forwards and a little diverging; on the lower side they are beset with small tubercles (in other species such as *tenax* these tubercles lie on the sides and above, but not below); at the front margin of the pupa the anterior larval spiracles are seen as two short horns, the pupa has thus in all four horns, two long ones above and two short ones below them. The larval tail is still found in the pupa, curved in various ways, and on the ventral side, the prolegs are visible. The length is about 12 mm.

No distinguishing characters are known for the different species, but according to Miall such may be found in the small spinules on the dermis; these being in some species simple, in others branched in various ways. For pupating the larva quits the water and pupates in the vicinity, generally on the earth but they are also sometimes seen at the surface of the water or they may suspend themselves on stalks, palings etc. by the tail. The eggs are deposited a little above the surface of the water. The eggs are whitish, oblong and finely shagreened.

The species of *Eristalis* are handsome, conspicuous flies and fairly good hoverers; they occur generally on flowers especially on Compositæ, Umbelliferæ and Cruciferæ in gardens as well as in waste places, and in valleys; I have even found *E. quinquelineatus* hovering over a bush of *Zygophyllum coccineum* in the desert more than one hundred miles away from any cultivation. They also frequently occur near water.

Of the genus more than 45 species have been recorded from the Palæarctic region and of these hitherto only 4 have been found in Egypt.

TABLE OF EGYPTIAN SPECIES.

1 (6) Eyes almost bare except for a small space above.

2 (3) Scutellum æneous like the thorax ; eyes spotted and touching in the male only for one third of the length of the vertical triangle. (Pl. V, fig. 6) . . . . 1 æneus Scop.

3 (2) Scutellum yellowish, or at least distinctly so translucently.

4 (5) Antennæ orange-yellow ; eyes touching in the male for two thirds of the length of the vertical triangle. (Pl. V, figs. 3, 4) . . . . 2 quinquelineatus F.

5 (4) Antennæ dark brown or blackish ; eyes touching in the male for about one half the length of the vertical triangle and with narrow dark bands. (Pl. V, fig. 2) . . . . 3 tæniops Wied.

6 (1) Eyes very hairy, some of the hairs being concentrated in two bands, quite the largest species. (Pl. V, fig. 1) . . . . 4 tenax L.

1. E. ÆNEUS **SCOP.** (Pl. V, fig. 6).

Scop., Ent. Carn., 356. 967. (*Conops*) (1763); Vill., Entom. Linn., III. 522. 287. (*Musca*) (1789); Fabr., Entom. Syst., IV. 302. 88. (*Syrphus*) (1794) et Syst. Antl., 244. 57. (1805); Panz., Fauna, Germ. LXXXII. 15. (*Syrphus*) (1801); Latr., Gen. Crust. Ins., IV. 324 et 332 (*Elophilus* et *Milesia*) (1809); Fall., Dipt. Suec. Syrph., 28. 22. (*Syrphus*) (1817); Meig., System. Beschreib., III. 384.2. (1822) et VII.143. (1838); Macq., Rec.Soc.Sci.Lille, 1827.309. (161). 2. (1827) et Suit. à Buff., I. 506. 16. (1834); Zett., Dipt. Scand., II. 668. 14. (*Syrphus*) (1843); Walk., List Dipt. Brit. Mus., III.610. (1849) et Ins. Britann., Dipt., I.244.4. (1851); Rond., Dipt. Prodr., II. 40. II. (1857) ; Schin., Verh. zool.-bot. Ges. Wien, VII. 390. 19. (1857) et Fauna Austr., I. 333.(1862); Palma, Annal. Acc. Asp. Nat. Nap., (2). III. 43.28. (1864); Willist., Syn. N.A. Syrph., 161. (1886); Verr., Trans. Ent. Soc. Lond., 1898. 415.7. (1898) et Brit. Fl., VIII. 501. 2. f. 348-49. (1901); How., Ins. Book, t. XX,

f. 14. (1902); Beck., Mitteil. Zool. Mus. Berl., II. 83. 118. (1903); Lundb., Dipt. Danica, V. 418-19. (1916).

SYNONYMY:—? *aenescens* Macq., Dipt. Exot., Suppl. II. (2). 117. (59) 45. (1842).

cuprovittatus Wied., Aussereurop. Zweifl., II. 190. 54. (1836).

flavicornis Rossi (*nec.* Fabr.) Faun. Etr., II. 290. 1465. (*Syrphus*) (1790); Illig., Fauna Etr. Rossi, II. 447. 1465. (*Syrphus*) (1807).

melanius Harris, Expos. Engl. Ins., 53 t. XV. f. 12. (*Musca*) (1776).

punctata Mull., Fauna Friedrichsd., 720 (*Musca*) (1746) et Zool. Dan. Prodr., 2050. (*Musca*) (1776); Vill., Entom. Linn., III. 465. 143. (*Musca*) (1789); Schrank, Fauna boica, III. 115. 2432. (*Musca*) (1803).

sincerus Walk., List Dipt. Brit. Mus., III. 611. (1849); T. Harris, Ins. injur. to Veg., 3ed., 609. (1862); Lw. Sillim. Journ. of Sci. and Arts, XXXVII. 317. (1864).

stygius Newm., Entom. Mag., II. 313. (1830).

taphicus Wied., Aussereurop. Zweifl., II. 191.57. (1830).

DIAGNOSIS:—Scutellum æneous like the thorax; eyes spotted and touching in the male only for one third of the length of the vertical triangle; species entirely shining æneous.

DESCRIPTION:—*Male:* Entirely shining æneous-black; face almost covered with greyish-white dust and whitish pubescence, except on a shining black, rather narrow, elongate central knob, which extends down to the upper mouth-edge; the space from the mouth-edge to the eyes is also shining black. Jowls fairly large, black with whitish pubescence; occipital border greyish-black with very short pubescence; occiput rather puffed out and shining, with larger luteous pubescence. Vertex shining black, rather long, with inconspicuous short tawny pubescence. Frons covered with dust and pubescence rather more yellow than that on the face, and leaving the small (sometimes very small) middle space shining black, and which is continued down to the sides of the antennæ, but with a luteous margin close against the antennæ.

Eyes reddish with dark spots, less numerous and more isolated and rounded on the lower part, but more numerous and irregularly coalescing on the upper part; they meet for a very short distance, about one third of the vertical triangle, and bear a very short

inconspicuous pubescence on the upper part only. Antennæ dull orange, but darkened about the base and often above the third joint; there are some tiny yellow bristles on the basal joints and two long and four or five much smaller black bristles on the second joint near the tip above; arista dull orange long and bare.

Thorax and scutellum all shining æneous, clothed with rather short, but dense, tawny pubescence; thorax nearly always with indications of light grey stripes, which never quite reach the lower margin.

Abdomen entirely the same unicolorous shining æneous, neat in shape and gradually decreasing in width from the base of the second segment to the end. Pubescence more or less tawny, ranging from all brownish-tawny to nearly all pale yellow, but usually brownish-tawny at the base. Venter shining black, with dull yellowish-grey hind margins and pale yellow pubescence, but on the disc of the fourth segment the pubescence is black and on the hind margin there are two tufts of black bristles which overhang the genitalia. Hypopygium rather large but not seen from above, and almost symmetrical.

Legs black, but the knees are rather broadly yellow including almost half of the anterior and a third of the hind tibiæ; anterior tarsi orange at the base up to almost the end of the basal joint; front coxæ orange at the tip. Hind femora moderate, and but little thicker than the others. Pubescence all moderate in length and fairly abundant, pale, except for a few bristly hairs beneath the hind femora near the tip, and a few tiny bristles on the dark tips of the anterior tibiæ and a part of the fringe inside the hind tibiæ.

Wings slightly tinged with brown, yellowish about the base, with a fairly long and rather conspicuous stigma, which is dark at the base; vena spuria hardly perceptible; the veinlets after cells R1 and R5 both turn upwards, especially the first; the basal portion of Radius 2+3 bears bristles. Squamulæ large, whitish-yellow with fringes of the same colour. Halteres yellow.

Female: Very similar to the male. Frons at the vertex rather narrow and scarcely widening until near the antennæ, shining black above and on the puffed out occiput, but brownish and coarsely punctate and dull in the middle; shining black again above the antennæ, with a narrow luteous front margin; its pubescence is brownish-yellow at the vertex, then black, then luteous with hairs turned backwards, ending with pale yellow hairs pointing forward. The pubescence of the eyes, which is still more limited than in the male is hardly perceptible. The five dull grey stripes on the thorax are much more distinct, and instead of

ending at about two-thirds of the way down are continued to the lower margin, thus rendering the latter a uniform dull grey. The fifth segment of the abdomen is small and triangular. Wings more pellucid than in the male.

Length from 9 to 12 mm.

This species is extremely common in Upper as well as Lower Egypt, and it may be found on flowers practically all the year round. My dates are from October to the same month of the following year, in Cairo.

It is recorded from nearly all Europe, and North America, Algiers, Syria, even far down in Africa and probably occurs in many other parts of the world.

2. E. QUINQUELINEATUS **FABR.** (Pl. V, figs. 3 and 4).

FABR., Spec. Ins., II. 425. 21. (*Syrphus*) (1781), Entom. Syst., IV. 290. 42. (*Syrphus*) (1794) et Syst. Antl., 239. 29. (1805); WIED., Aussereurop. Zweifl., II. 185. 47. (1830); ERICHS., Jahresber., 1847. (1847); Lw., Œfv. Vet. Akad. Forhandl., XIV. 382.40. (1857), Berl. Entom. Zeitschr., II. 230. (1858) et Dipterenf. Südafr., (396), 324. 8. (1860); SCHIN., Verh. zool.-bot. Ges. Wien., VII. 397. 18. (1857) et Nov. Reise, Dipt., 364. 84. (1868); VERR., Trans. Ent. Soc. Lond., 1898. 415. 9. (1898); BECK., Mitteil. Zool. Mus. Berl., II. 82. 116. (1903); BEZ., Syrph. Ethiop. Region, 84. 81. (*Lathyrophthalmus*) et 82 (*L. tabanoïdes*) (1915).

SYNONYMY:—fasciatus MEIG., System. Beschreib., VII. 143. 22. (1838); GERM., Faun. Ins. Europ., XXIII. 23. (1839).

megacefalus ROSSI, Mant. Ins., II. 63. 532. t.v.f. 4. (*Syrphus*) (1794).

punctifer WALK., Entom., V. 274. 55. (1871); YERB., Entom. Monthly Mag., (2) XII. 77. (1901).

quinque-fasciatus SCHIN., Nov. Reise, Dipt., 364. (1860); BECK., Mitteil. Zool. Mus. Berl., II. 81. (1903).

quinque-striatus F., Entom. Syst., IV. 289. 41. (*Syrphus*) (1794) et Syst. Antl., 245. 60. (1805); WIED., Aussereurop. Zweifl. Ins., II. 187. 50. (1830).

quinquevittatus MACQ., LUC. Explor. Alg., Zool., III. 465. 154. t. IV. f. 10. (1849).

?*ridens* WALK., List Dipt. Brit. Mus., III. 610 (1849).

tabanoïdes JAENN., Abhandl. Senkt. Ges., VI. 402. (94). 126. t. II. f. 10. (1867); BECK., Mitteil. Zool. Mus. Berl., II. 83. 117. (1903).

DIAGNOSIS:—Antennæ orange-yellow ; eyes touching in the male for two-thirds of the length of the vertical triangle.

DESCRIPTION:— *Male:* Face entirely black and covered with a dense light silvery-grey tomentum, as well as with a soft yellowish-grey pubescence, except on the shallow hollow below the antennæ. The prominence of the face and the two thin longitudinal lines beside it, the upper mouth-edge and the two lines on the genæ are all shining black. Vertex shining black with black pubescence. Frons covered with hairs, which are light grey in front, but black on the middle and below, except for a very small shining black space just above the antennæ. Eyes reddish-yellow, touching for a fairly long distance; they are spotted with brown and possess short light brown hairs, which are nearly always seen only on the superior part of the head ; on this upper part the spots are more frequent, run together, and in rare cases they are entirely absent. Antennæ reddish-yellow, but at the base and upper part of the third joint brown, with a reddish-brown and fairly long and bare arista.

Thorax is shining æneous black and bears five greyish-white longitudinal stripes which never reach the lower margin, but as a rule, they end about two-thirds of the way down and sometimes half the way down the thorax ; of these the median is the narrowest, the two lateral the broadest, and the two others intermediate in breadth. Pubescence is equal, dense and light grey, but on the margin and pleuræ it is much longer and of an ashy-grey colour. Scutellum brownish-yellow, translucent, with a vestiture similar to that of the thorax.

Abdomen reddish-yellow ; the basal segment is whitish-grey on the sides and dull dark grey in the centre, with its lower margin shining black and covered with a short lead-grey pubescence. The second segment possesses on its upper margin a wide dull black band, which is crescent-shaped and supported by a median line with an expanding base (somewhat resembling an urn), which reaches to the lower margin ; this base is continued laterally in a thin line, which again widens as it reaches the side margin ; sometimes this line is interrupted in the middle so that only its widened ends remain, and are seen like fairly large spots on the lower side-margins; the segment is clothed with yellowish pubescence, about the same length as that of the thorax and its lower end has a metallic sheen. The third segment is not very unlike

the second, but the black band which originates from the upper margin does not extend more than a fourth of the way to the sides, and it is interrupted a little higher up than the middle of the segment by a transverse, yellowish, dull band ; also the black markings on the lower end of this segment is much deeper than on the second segment and has a metallic sheen. The fourth segment is shining æneous-black with a fairly thick, yellowish-grey transverse band which is situated in the upper two-thirds of the segment and slightly drawn forward in its centre ; this segment (as well as the third segment) possesses a light yellow pubescence, which is longer on the fourth segment than on any of the others. Venter dull yellow, but shining towards the middle of the last three segments ; its pubescence is not so dense as on the abdomen, but longer. Hypopygium is asymmetrical, shining bronze and partly covered with greyish dust.

Legs shining bronze-black, except at the tip of the femora ; the basal third of the posterior tibiæ and the basal halves of the anterior tibiæ are yellow ; tarsi also shining bronze-black except the basal half of the metatarsus, which is rusty-yellow. Pubescence on legs fairly abundant, soft and pale, except on the inner sides of the posterior tibiæ, black ; however in many specimens there are black hairs intermingled with the pale ones, even on the anterior tibiæ and metatarsi.

Wings pellucid with the costa yellowish. Squamulæ yellowish-white with a yellow fringe. Halteres yellowish.

Female: The female is not very much unlike the male, but usually the abdominal markings are rather different, with the addition of white colour to the yellow and black. The five longitudinal, dull, whitish-grey stripes of the thorax are much wider and more conspicuous, and at the hind-margin the two intermediate ones (one on each side of the median stripe) become expanded, joining with the stripes on each side and with the median one, thus forming an irregular light grey band ; indeed these bands are sometimes so evident that it gives one the appearance of the thorax being whitish-grey with four shining æneous broad longitudinal stripes ; thus Jænnicke fell into this error and in his original description of *E. tabanoïdes*, he describes the thorax as such : "Thorax whitish grey, yellow haired, with four large shining green-bronze coloured stripes..." The first segment of the abdomen is whitish-yellow, almost white, and somewhat dark opaque grey towards the centre. The second segment is reddish-yellow (sometimes it is quite red) and is traversed in its middle by a dull yellowish-white, often pure white band, which is constricted in the centre and as a rule extends to the side margins ; the lower margin

of this segment is shining bronze and the upper margin has the same crescent-shaped marking as in the male. The third segment is very much like the second, but the transverse dull yellow band is somewhat nearer to the upper margin; the lower half of this segment, as well as that of the fourth segment is shining bronze. The fourth and sixth segments also possess broad whitish bands, which are situated in their upper halves and the fifth segment is entirely shining bronze. The seventh segment is very pointed and also all shining bronze. The vestiture of the two last segments is longer and very pale. Venter resembles that in the male, dull yellow with the shining median areas, but these appear much darker owing to the black markings of the abdomen being seen by transparency. Halteres white.

Length from 8½ to 12½ mm.

There seems to have been some confusion over the nomenclature and stability of the two sexes in this species, and this has no doubt arisen from the fact that the commonest form of the female is that which bears the least resemblance to the male as regards the abdominal markings; inasmuch as the few writers who have dealt with this species have probably not had the chance to compare large series. Jænnicke (1868) describes the female as *E. tabanoïdes* from a specimen in the Frankfort and Darmstadt Museum found by Rüppell in Massawa. Much later Becker (1902) states that he found a specimen in the Ezbekieh Gardens, Cairo, which corresponded with Jænnicke's *E. tabanoïdes* and that "it was well described by Jænnicke and easily recognisable from him description". Previously, immediately before his excellent description of *E. 5-lineatus* male, Becker also states "So far only the female was described ; the male seems to be unknown, and perhaps, as it has the abdominal markings different from those of the female it is described under another name; but amongst the African species I have not been able to find any which would enable me to arrive to any definite conclusions as to its identity. For this reason I give its complete description. There is no doubt that the two sexes belong to each other, as I have always found them together in the same localities."

It is curious that both Jænnicke and Becker should have only dealt with single female specimens of *E. tabanoïdes* and that the male should never have been found. I have not the least doubt as to the correctness of Becker's concluding statement that he found the two sexes in the same locality — but I am also quite certain that, had he searched more, he would undoubtedly have found in the Ezbékieh Gardens—the other sex (*i.e.* the male) and it would

have been that of *E. 5-lineatus.* Moreover, although Jænnicke's description is an excellent one for the time, it is far from complete, and I do not consider that there are sufficient grounds for making another species of it. His "thorax whitish-grey, yellowish haired, with four shining green-bronze coloured bands, sides of thorax grey, silver grey haired" is erroneous, as the "whitish-grey" colour is due to a very fine pulverulence of that colour, which can be rubbed off with a fine camel-hair brush leaving the black background. Further his "reddish-white" dull bands of the abdomen is of rather common occurrence in the females of *E. 5-lineatus,* and in my opinion is due to change of colour in the cuticle simply from the small amount of decomposition which takes place when the insect is drying, which might be somewhat indirectly related to the colour and nature of the food of the adult. All my specimens are mounted on white card discs and in those specimens which possess the bands of the abdomen reddish instead of white, at the place where the anus comes in contact with the card, it is stained reddish. I also possess in my large series of more than fifty individuals of each sex, several intermediate stages as regards the colour of these light abdominal bands and I have every reason to believe that specimens with such colours may be considered, at the most, as *forms* or *varieties* of *E. 5-lineatus.*

The species is fairly common in Egypt, especially during the months of September and October, but I possess individuals caught in November, February, March, April, June, July, August and September. However, as a rule it is rare except in the two above-mentioned autumn months.

It is known to occur in the Ethiopian Region, and Europe and no doubt it exists in other parts of Africa and may occur in other parts of the world.

3. E. TAENIOPS **WIED.** (Pl. V, fig. 2).

Wied., Zool. Mag., II. 42. (1819) et Aussereurop. Zweifl., 182.43. (1830); Lw., Œfv. Vet. Akad. Forhandl., XIV. 382.39. (1857). Berl. Entom. Zeitschr., II. 230. (1858) et Dipterenf. Südafr., (396). 324.7. (1860) ; Ricardo, Annal. Mag. Nat. Hist., VII. (7). 106. (1901); Beck., Mitteil. Zool. Mus. Berl., II. 82.115. (1903); Bez., Syrph. Ethiop. Region, 90.91. (*Eristalodes*) (1915).

SYNONYMY:—ægyptius Walk., List Dipt. Brit. Mus., III. 621. (1849).

fasciatus Lw., Germ. Fauna, 24.22. (1839)?

pulchriceps MEIG., System. Beschreib., III. 375.8. (*Helophilus*) (1822) ; MACQ., Suit. à Buff., I. 505.14. (1834) ; GERM., Fauna ins. Europ., XXII. 22. (1839) ; Lw., Stettin. Entom. Zeitg., II. 26.2. (*Helophilus*) (1841) ; REND., Dipterol. Prodr., II.40.10. (1857). SCHIN., Verh. zool.-bot. Ges. Wien., VII. 397.17. (1897).

tæniopus MIK, Wien. Entom. Zeitg., XVI. 114. (1897); GIRSCHN., Ill. Wochenschr. Entom., II. 602. (1897).

torridus WALK., List Dipt. Brit. Mus., III. 612. (1849).

DIAGNOSIS:—Antennæ dark brown; eyes touching in the male for almost one half the length of the vertical triangle, and with narrow dark bands.

This fairly large and handsome species may easily be distinguished by the dark bands on the eyes and the very indistinct thoracic stripes.

DESCRIPTION:—*Male:* Face with a central black stripe and two dull black stripes in the centre of the genæ. The central stripe extends from the end of the hollow below the antennæ to the end of the prominence of the face, while the two others begin near the base of the antennæ and end on a straight line with the central stripe and are thin and narrow above, gradually increasing in thickness in their base. The rest of the face, as well as the mouth and jowls, are entirely covered with golden-yellow dust and possess many yellow hairs. Frons covered with tawny dust and longish black hairs above, to shining pale on the sides below, except for a fairly large shining dark brown triangular area just above the base of the antennæ ; this triangle has an elongated central depression, which extends from its base to two-thirds of its height and the base of this triangle is pale yellow. Vertex is shining black and somewhat rugose and possesses black hairs ; the top of the vertical triangle is covered with orange-brown dust. Pubescence on the occiput very short, dark and inconspicuous. Eyes meet for a fairly long distance, reddish and with beautiful orange-golden iridescence; they are hairy only for a small area above, and possess (apart from their front and hind margins which are black) five uneven black stripes, which are of about the same width as the six reddish stripes left by the ground colour. Antennæ dark brown except for a small, roundish, orange spot on the upper edge of the flat and oval third joint; arista fairly long, thin and quite bare.

Thorax of an indefinite greyish-yellow colour, somewhat shining towards the centre, and with four indistinct darker stripes; the two side stripes are as a rule inter-

rupted by a fairly large space in their middle, which space is equal in length to that of the upper end of the stripe, the sutures being situated in the centre of these interruptions ; the lower halves of these stripes extend some distance below the centre of the thorax and gradually decrease in width downwards ; the two middle stripes extend from the top of the thorax to about its middle. Postalar calli very large, prominent and shining dark brown. Scutellum orange-yellow, translucent and shining. Pubescence of the thorax and the scutellum is light yellow, thick all over but short and even.

Abdomen orange-yellow with transverse black markings ; the basal segment is very pale yellow and shining ; the second segment dull orange-yellow, except in the centre, where it is yellowish-white and its upper and lower margins which are dull black, forming two fairly large and conspicuous black bands, which are thicker towards the centre and gradually become thinner towards the side margins ; the third segment has its upper half [illegible] orange, except for its extreme upper margin which is deep orange, and for a black elongate spot in the centre of this margin ; the lower half of the segment is dark brown [illegible] gradually [illegible] deeper below until it reaches the lower margin, which is deep metallic black and traversed by a thick wavy whitish-yellow band, which, on the sides of the segment is situated about the middle, and in the centre much higher up, its upper edge almost touching the upper margin ; the lower end of this segment is very shining ; the fifth, sixth and seventh segments are black and almost completely retracted in the fourth. Pubescence of the abdomen mainly following the ground colour, fairly dense but short and slightly longer and uniformly paler on the fourth segment. Venter orange-yellow and opaque, rather deep coloured in the centre and much lighter at the base ; the basal half of the fourth segment is brown and its lower half black ; its pubescence is very thin and scattered and almost all pure white.

Legs with the front and hind femora dark brown and with the tip of the two front pairs yellow ; hind tibiæ dark brown, almost black, except at the base where they are very pale yellow ; they are compressed about the middle and rather twisted. Front and middle tibiæ have their basal halves pale yellow and their distal halves brown ; front and hind tarsi with their dorsal surface dark yellow, and their tips dark brown dorsally, but paler below. Vestiture of legs mainly following the ground colour, fairly short except on the hind femora and tibiæ, where they are coarser and longer.

Wings pale yellowish-brown near the base, with a small

quadrate spot under the end of the subcostal vein, in which spot there is a distinct cross vein ; the veinlet after the closed cell R1 is prolonged towards the tip of the wing and this prolongation is about half the length of that in *E. tenax.* Vena spuria rather faint and very pale yellow; Anal 2, undulated. Squamulæ very pale yellow, thoracal pair very large with a dark brown edge and with a fringe only on the lower half; alar pair much smaller with a thick fringe of longer pale hairs. Halteres pale yellow.

Female is very similar to the male, but as a rule the eyes are devoid of the golden iridescence, the ground colour of the abdomen somewhat less bright, and the hind legs lighter in colour.

Length from 11 to 14 mm.

E. tæniops is one of the commonest of the Egyptian Syrphidæ and is found nearly the whole year round. My records date from October to the middle of August. It is very widely distributed and has been recorded from the Ethiopian Region and Europe, and probably exists in many other parts of the world.

4. E. TENAX L. (Pl. V, fig. 1).

Linn., Syst. Nat., X. 591. (*Musca*) (1758), XII. II. 984.32. (*Musca*) (1767) et Faun. Suec., 1799; (*Musca*) (1761); Réaum., Mém. Ins., I. t. II. (1734) et IV t. XX. f. 8. (——) (1738) ; Swammerd., Biblia Nat., I. t. XXXVIII f.g. (——) (1737); Geoffr., Hist. Ins., II. 520. 52. (——) (1764); O.F. Mull., Faun. Friedrichsd., 716, (*Musca*) (1764); Fabr., Syst. Entom., 765. 15. (*Syrphus*) (1775), Spec. Ins., II. 425. 19. (*Syrphus*) (1786), Entom. Syst., IV. 288. 36. (*Syrphus*) (1794) et Syst. Antl., 238. 24. (1805); Harr., Expos. Eng. Ins., 41. t. X. (2) f. 1. (*Musca*) (1776); Gmell., Syst. Nat., V. 2870. 32. (*Musca*) (1788); Vill., Entom. Linn., III. 436. 81. (*Musca*) (1789); Rossi, Faun. Etr., II. 285. 1455. (*Syrphus*) (1790); Panz., Faun. Germ., XIV. 23. 24. (*Syrphus*) (1794); Cederh., Faun. Ingr. Prodr., 303. 952. (*Syrphus*) (1798); Schrank, Fauna boica, III. 113. 2427 (*Musca*) (1803); Schell., Genr. Mouch. Dipt., 52. t. IX. f. 1. (*Syrphus*) (1803); Latr., Hist. Nat. Crust. Ins., XIV. 364. 3. (1804) et Gen. Crust. Ins., IV. 324. (*Elophilus*) (1809); Shaw, Gener. Zool., VI. 380 t. 146. (*Musca*) (1806); Dwig., Primit. faun. Mosqu., 178. 665. (*Musca*) (1802); Illig., Faun. Etr. Rossi, II. 441. 1455. (*Syrphus*) (1807); Donov., Brit. Ins., XVI. 66. t. 574. (*Musca*) (1883); Fall., Dipt. Suec. Syrph., 26. 17. (*Syrphus*) (1817); Meig., System. Beschreib., III. 385. 4. (1822); Macq., Rec. Soc. Sci. Lille. 1827. 310. (162). 3. t., III. f. 5. (1827) et Suit. à Buff., I.

504. 11. (1843); ZETT., Ins. Lapp., 594. 7. (*Syrphus*) (1838), et Dipt. Scand., II. 661. 7. (1843). VIII. 3113. 7. (1849), XI. 4301. 7. (1852), XII. 4651. 7. (*Syrphus*) (1855); WESTW., Introd., II. 559. f. 131. 7-9; (1840); ERICHS., Entom., t. II. f. E. c. e. (1840); WALK., List Dipt. Brit. Mus., III. 610. (1849) et Ins. Britann., I. 243. 1. t. IX. f. 5. (1851); ROND., Nuov. Annal. Sci. Nat. Bologna, (3). II. t. IV. f. 2. (1850) et Dipterol. Prodr., II. 42. 9. (1857); HAL., Stettin. Entom. Zeitg., XII. 139. (1851); LETZNER, Arb. schles. Ges., 1856. 117. (1856); FRNLD., Verh. zool.-bot. Ges. Wien, VI. 439. (1856); F. MULL., Trans. Entom. Soc. Lond., VI. 336. (1851) et Entom. Monthly Mag., VIII. 273. (1872); SCHIN., Verh. zool.-bot. Ges. Wien, VII. 390. 1. (1857) et Fauna Austr., I. 334. (1862); BONSD., Finnl. tvaving. Ins. I.222.7. (*Syrphus*) (1861); BOWERB., Entom., VI.547.(1872); OST.-SACK., Cat.N.A. Dipt., 2 ed., 249. 228. (1878), Entom. Monthly Mag., XXIII. 97. (1883), Trans. Entom. Soc. Lond., 1884. 489. 1. (1884), Bull. Soc. Entom. Ital., XXV. 186. (1893), On the so call. Bug., Heidlg. (1894) et Berl. Entom. Zeitschr., XL. 142. (1895); BATELLI, Bull. Soc. Entom. Ital., XI. 77. t. I-V. (1879), et Ann. Mag. Nat. Hist., (5) III. 94. (1880); MEINERT, Trophi Dipt., t. v. f. 21. (1881); WILLIST., Syn. N.A. Syrph., 160. t. VII. f. 7. (1886); HUDSON, Trans. N. Zeal. Instit., XXII. 187. (1889); RIL. et How., Ins. Life, II.262. (1889) et III. 22. (1890); J.B. SMITH, Trans. Am. Ent. Soc., XXII. 334. f. 18. (1890) et Trans. Am. Phil. Soc., XIX. t. 1. f. 3., t. III. f. 5. 10. (1896); GRIFF., Bull. Mus. Torino, VIII. (143). 3. (1893); SMITH, Entom. Monthly Mag., XXVI. 240 (1890); BUCKTON, Nat. Hist. Er. tenax, (1895); MIALL, Nat. Hist. Aquat. Ins., 1 ed., 198. (1895) et 2 ed., 198. f. 70-77. (1903); TYL-TOWNS., Trans. Am. Ent. Soc. XXII. 49. (1895); GIRSCHN., Ill. Wochenschr. Entom. II. t. III. f. 17. 18. (1897); WANDOLL., Zool. Anz., 1898. 289. f. 2. (1898); PLATEAU, Mém. Soc. Zool. France, 1900. 283. (1900); MEIJ., Entom. Tijdschr., XXXVIII. 21. f. 21. (1900) et Zool. Jahrb., XIV. t. VII. f. 39. (1900) et t. XXXV. f. 127-128. (1901) et XV. 678. f. 43. (1902); VERR., Brit. Fl., VIII. 505. 4. f. 350-352.(1901); HUTTON, Trans. N. Zeal. Instit. XXXIII. 36. (1900); CHAGNON, Nat. Can., 1901. 51. 1. (1901); W.W. SMITH, Entom. Monthly Mag. (2). XII. 300. (1901); How., Insect Book, t. XX. f. 22. (1902); ALDRICH, Cat. N.A. Dipt., 389. (1905); BEZ., Syrph. Ethiop. Region, 93. 94. (1915); LUNDB., Dipt. Danica, V. 422-425. (1916).

SYNONYMY:—arbustorum SCHRANK, (*Nec.* L.) Enum. Ins., 445. 902 (*Musca*) (1781).

fuscus SCOP., Ent. Carn., 355. 961. (*Conops*) (1763); VILL., Entom. Linn., III. 461. 132. (*Musca*) (1789); SCHIN., Verh. zool.-bot. Ges. Wien, VI. 418. (1856).

porcinus Deg., Ins., VI. 98. 1. (*Musca*) (1776) et ed. Gœtze, VI. 45. 1. (*Musca*) (1782).

silvaticus Meig., System. Beschreib., III. 388. 8. (1822).

vulgaris Scop., Entom. Carn., 354. 960. (*Conops*) (1763).

vulpinus Meig., System. Beschreib., III. 388. 7. (1822); Schin., Verh. zool.-bot.. Ges. Wien, VII. 392. 3. (1857) et Fauna Austr., I. 334. (1882).

var. alpinus Strobl (*nec.* Panz.) Mittheil. Naturwiss. Ver. Steiermark, XXIX. 185. (1893).

var. campestris Meig., System. Beschreib. III. 387. 5. (1822); Macq., Rec. Soc. Sci. Lille, 1827.312. (164) 4. (1827) et Suit. à Buff., I. 505. 12. (1834); Lw., Programm. Posen, 38.4. (1840) et Isis, 1840. 574. 4. (1840).

var. hortorum Meig., System. Beschreib., III. 387. 6. (1822) et VII. 143. 4. (1840).

vulpinus Meig. = Tenax L. *var. hortorum* Meig.

DIAGNOSIS:—Antennæ blackish; eyes very hairy, some of the hairs being concentrated in two bands; hind tibiæ compressed, ciliate on upper and under sides.

A common large species resembling the Hive Bee.

DESCRIPTION:—*Male:* Face with a broad central black stripe, which is shining, and extends from above the antennæ down to the mouth; on the middle of the face this stripe occupies more than one third of the width, but it narrows near the mouth, and is quite free from pubescence about its centre; the sides of the face are entirely covered with yellow dust and possess many yellow hairs; pubescence on occiput is long and shaggy on the upper part, and longer and denser on the lower half. Eyes very hairy and there are two rather indefinite stripes of dense brown hairs running down each side of the middle of the eye, the other hairs being more scattered and paler. Antennæ dark brown, thinly covered with yellow dust, with the third joint bearing a long thin and bare arista.

Thorax shining brownish-black, but rather dull in front and all the thorax is somewhat obscured by the abundant, fairly short tawny pubescence; it is devoid of bristles or hairs except for a tuft of pale hairs on the postalar calli. Scutellum brownish-yellow, rather hidden by the pale hairs (which are of about the same length as those on the postalar calli) which it bears. Abdomen with yellowish-orange markings varying very much in extent from almost absent, up to covering nearly all the second and third segments, except for some dorsal markings. Pubescence shorter than

on the thorax and not so erect and consequently the ground colour appears blacker and more shining.

Legs usually black, with the knees and the basal third of the front and the basal half of the middle tibiæ yellow; the base of the middle tarsi is also yellow. Pubescence on the anterior legs fairly abundant, very equal and of a faded yellow colour; on the hind legs the femora bear an abundant tawny pubescence, and beneath, a row of coarse black hairs, while the tibiæ bear dark tawny pubescence, with a tuft of coarser black hairs, just after the middle on the under surface; the tibiæ are rather compressed about the middle, and somewhat twisted.

Wings pale brownish on the front half, with a small dark brown spot under the end of the subcostal vein, in which spot there is an indistinct cross-vein. The veinlet after the closed cell R1 is prolonged towards the tip of the wing; Anal 2 much undulated. Squamulæ dull pale yellowish, the thoracal pair are large and have dense coarse yellowish fringes; the alar ones are also rather large and have a moderately long, simpler, though denser and coarser fringes. Halteres pale yellow, head of club, brown.

Female:—Very similar to the male, but the eyes are usually more bare, the broad vertex shining black with black hairs, and separated from the black triangle above the antennæ by the union of the dust on the sides of the frons, though in the region of the union the dust gets thinner and in the hollow below the antennæ the dust covers both sides of the face; the frons, as a rule, has yellow hairs, but sometimes black, or yellow and black hairs intermixed.

Length from 16 to 18 mm.

The abdomen varies very considerably in its pale markings and some specimens I possess are entirely black, except for the very thin orange-yellow hind margins of the second and third segments.

E. tenax is the largest and most widely distributed species of our Egyptian Syrphidæ; it is also fairly common. I possess specimens from Cairo, Alexandria, Mariout, Fayoum, Wadi Hoff, etc. and it will certainly be found in many other localities; my dates extend from January to January of the following year. It is also probably the most widely distributed species of the Syrphidæ in the world, and Verrall states that it occurs wherever man has established any system of drainage, whence it is essentially known as the Drain Fly, though from its resemblance to the male of *Apis mellifica* it is known in England as the "Drone Fly". It occurs in nearly all Europe, India, China, Japan, Cape of Good Hope, North America, Ethiopian Region and New Zealand.

8. HELOPHILUS MEIG.

MEIG., System. Beschreib, III. 368. CXV. (1822).

SYNONYMY:—Tubifera MEIG., Nouv. classif., 34. 68. (1800).

Elophilus MEIG., in Illig. Mag. f. Ins., II. 274.78. (1803).

Dolichogyna MACQ., Dipt. Exot., II. 2., 65.18. (1842).

Liops ROND., Dipterol. Prodr., II. 33. (*Lejops*) (1857).

Mesembrius ROND., Dipterol. Prodr., II. 50. *nota* (1857).

Anasimyia SCHIN., Catal. syst. Dipt. Europ., 108. (1864).

Eurymyia MIK, in BECK., Fauna v. Hernstein, II. 2., 68. (1885).

Eurimyia BIG., Annal. Soc. Entom. Fr., (6). III. Bullet., XX. (1883).

Eurhimyia BIG., Annal. Soc. Entom. Fr., (6). III. 226. 230. (1883).

Eurinomyia MIK, Wien. Entom. Zeitg., XVI. 115. (1897).

Parhelophilus GIRSCHN., Illustr. Wochenschr. f. Entom., II. 604. (1897).

This genus is closely allied to *Eristalis*, but distinguished by cell R1 which is open, the bare eyes, and the less pubescent and longitudinally striped thorax.

Face with a central knob and with a more or less produced upper mouth-edge ; eyes always bare and nearly always well separated in both sexes, although the separation is less in the males than in the females and in our only Egyptian species, (*Mesembrius capensis*) they are almost touching in the male. Antennæ moderate and bearing dorsally a bare and simple arista. Thorax dull blackish with conspicuous longitudinal yellowish lines and less pubescent than in *Eristalis*. Scutellum usually brownish-yellow.

Abdomen rather dull black with conspicuous yellowish-orange markings on the second, third and sometimes also the fourth segments ; pubescence more or less dense. Legs strong and blackish; the hind femora are thickened and the hind tibiæ curved.

Wings very similar to *Eristalis* but cell R1 is opened instead of being closed. Squamulæ very large.

SYNONYMY:—I cannot do better here than give Verrall's opinion which is as follows "As is the case in most old genera it is "difficult to absolutely limit the original formation of the genus "*Helophilus* as now accepted. A genus *Elophilus* was proposed by "Meigen in 1803 for "*Syrphus tenax, nemorum, floreus, pendulus* "etc. *Fabr.*" which might appear to be prior to and identical with "*Eristalis*; but at the same time Meigen proposed a genus *Helio-*"*philus* for '*Syrphus sylvarum* etc. *Fabr.!*' In 1804 Meigen gave a "most unsatisfactory distinction between *Elophila* with 'die Borste "gefiedert" and *Heliophilus* with 'die Borste einfach.' None of these "names can honestly claim priority, because whichever may be "considered the type species may well belong to some other very "distinct species and consequently in my opinion Meigen's limita-"tion of these genera in 1882 is the first firm foundation upon "which we can build, and he then limited *Helophilus* to the group "which is now included under that name and at the same time he "well distinguished the allied genera or groups of *Eristalis*, "*Mallota* and *Merodon*, and I cannot see any reason for differing "from his definitions. It is quite certain that we are not justified "in applying laws of priority *now* which were not *then* recognised, "unless they were unrecognised, admitted, or accidental and obvious "synonyms. We ought, as far as possible, to accept the practice of "the time in which the practice was adopted, or else the practice "which we adopt now is almost certain to be upset by the next "generation, and no approximation to finality will ever occur. I "therefore accept and defend the modern limitations and the "present acceptation of the name of the genus *Helophilus*, even "though I may allow that certain groups are entitled to subgeneric "rank."

The members of this genus mainly occur in marshy districts and are nearly all attracted by *Compositæ* and *Umbelliferæ*.

Verrall says that the metamorphoses of scarcely any species are known, but Meigen states that *H. pendulus* has been bred from putrid water, which quite agrees with the habits of the species and is only natural in connection with its obvious relationship to *Eristalis*.

1. H. (MESEMBRIUS) CAPENSIS MACQ.

(Pl. V, fig. 5., Pl. I, fig. 12 and Pl. II, figs. 4, 7 and 9).

Macq., Dipt. Exot., II. 2., 62.2. t. XI. f. 3. (*Helophilus*) (1842); Lw., Dipterenf. Südafr., I. 313. *Anmerk.* 2. (*Helophilus*) (1860); Kert., Catal. Dipteror., VII. 250. (*Tubifera*) (1907); Bez., Syrph. Ethiop. Region, 95.97. (1915).

SYNONYMY:—?caffra Lw., Œfv. Kongl. Vet. Akad. Forhandl., XIV. 1857.380.27. (*Helophilus*) (1858) et Dipterenf. Südafr., I. 312. 1. (*Helophilus*) (1860); Karsch. Berlin. Entom. Zeitschr., XXXI. 381.51. (*Helophilus*) (1887).

DIAGNOSIS:— A fairly large and handsome fly which is easily distinguished by its wing venation (cell R1 open), the tuft of globiferous hairs on the joint between the hind tibiæ and tarsi of the male and by its bright colour.

DESCRIPTION:— Male: Face covered with shining pale yellow dust and hairs except in the shallow hollow below the antennæ and on a rather shining median black stripe which extends to the rather produced mouth; frons also covered with pale yellow shining dust and hairs (sometimes it is almost pure silvery-white) except for a small shining brown and bare triangular piece at the base of the antennæ ; the light yellow hairs on the frons are more scattered and less numerous than on the face ; vertex black with some blackish hairs and the front third of the vertical triangle with yellow dust ; occiput entirely covered with yellow dust and a few very short, pale and inconspicuous hairs above. Eyes black, bare, not quite meeting. Antennæ blackish and the third joint which is not long possesses a bare, simple, dark brown arista ; the two basal joints possess some black, erect bristles and those on the second joint are longer.

Thorax dull black, with five conspicuous longitudinal stripes, made of orange-yellow dust ; the central stripe is by far the narrowest and reaches only half way down the disc ; the two intermediate stripes are straight and even and reach about four-fifths the way down, where they meet and spread to the base and laterally to the lateral stripes Pubescence rather abundant, but very short except on the sides where it is longish, yellow and tufted. Scutellum large, orange-yellow, transparent, with a medium pale yellow pubescence.

Abdomen about as long as the thorax (or even longer) tapering gradually towards the apex, dull black with bright orange side-markings ; the first segment is dull black with a very straight grey hind margin ; the second segment has the sides all orange which colour extends on the disc in a large blunt triangle leaving about the middle sixth of the disc black, and connecting the black base with a black band which runs right across the disc (but not to the side margins) just before the narrow orange hind margin ; this black band is widest at its middle and gradually narrows to a point near the side margins, the black markings on this segment thus

resembling an urn. The third segment has its upper half nearly always all orange, while its lower half possesses a black band which is deeper and wider than the one on the previous segment and is also widest at its middle; this black band runs right across the disc to the side-margins before the orange hind margin; sometimes this black band is continued upwards in the centre in a thin black line to the upper margin. The fourth segment is blackish with an orange hind margin, but is rather inclined to grey near the front margin. The fifth segment is black and rather retracted in the fourth. Pubescence very short and even on the three first segments, where it is usually pale yellow; on the fourth and fifth segments it is longer and denser. Venter orange with the black dorsal markings showing through by transparency; the sixth and seventh segments are black and completely retracted into the fifth; pubescence thinner but longer than on the dorsum. Hypopygium asymmetric and dull brown. Legs black and orange, the orange being on the apical sixth of the front and middle femora, the basal halves of the front and middle tibiæ and the middle metatarsi; the hind legs are entirely black except the apices of the tibiæ which are brownish; the hind femora are considerably dilated and the hind tibiæ are conspicuously curved, (Pl. II. fig. 4) commencing with a jerk soon after the base; these hind tibiæ possess beneath, an elongated groove, which is bordered on each side by a fairly prominent ridge; the outer ridge is hollowed beneath at the tip and resembles a short spine, while the inner one is prolonged lower down to the base, also hollowed beneath at the tip and resembles a strong curved tooth ; on the joint between the hind tibiæ and tarsi there is a tuft of remarkable black globiferous hairs, (Pl. II, fig. 7.). Pubescence on the anterior legs abundant and orange on the outer side only, the inner side being quite bare and somewhat shining; on the outer side of the posterior tibiæ it is longer, more tufted and yellow, while on the inner side it is blackish.

Wings grey and shining ; there is a small dark brown spot under the end of the subcostal vein and a distinct cross-vein from the subcostal vein to Radius 1; Median cross-vein much undulated. Squamulæ large and pale yellow with dense pale yellow fringes and the disc orange. Halteres yellow.

Female : Similar to the male but differs from it by the wide separation of the eyes and by the pubescence of the thorax, abdomen and legs being shorter and somewhat paler; also the central black longitudinal band on the second segment of the abdomen is very often interrupted in the middle, leaving only the top and the base of the urn-shaped marking ; the tibiæ, although conspicuously

curved, are simple and free from any grooves or ridges, and the black globiferous hairs between the tibiae and tarsi are absent.

This species seems to be very rare in the neighbourhood of Cairo, but in Alexandria, I found it rather commonly in July, August and September, in wet and boggy places on the edges of the Mahmoudiah Canal and the Salt Lakes, where I have obtained a very large and handsome series. The only two other specimens known from other localities are both in my collection, the first was captured at Kerdacé (near the Giza Pyramids) in November and the second in Koubba gardens in October. This is an interesting and important addition to the Syrphid fauna of Egypt, as I believe this to be its first record from so far North of Africa.

It is known to occur in South Africa, British East Africa, Nyassaland, Uganda and in the Ethiopian Region.

MILESINÆ

9. SYRITTA ST-FARG. & SERV.

St-Farg. & Serv., Encyclop. Méthod., X. 888. (1825).

SYNONYMY:— Coprina Zett., Ins. Lapp., 584.45. (1838), *nec.* Rob.-Desw., 1830. Dipt.

Planes Rond., Archivio per la Zoolog., III.9. (1863).

Xylota Westw., (*nec* Meig.), Introd. mod. Classif., Synopsis, 136. (1840).

Face with a sharp central keel; the vertex of the male is long and narrow; frons bare, short and slightly produced. Eyes large, quite bare, touching for a fairly short distance in the male, but widely separated in the female. Antennæ moderate with a rather long and rounded third joint, which bears dorsally a long and bare arista. Thorax rather long and with the base, humeri, the sides down to the suture, as well as all the pleuræ, covered with pale, light coloured dust. The abdomen is thin, elongated and brightly coloured with yellow and black ; the anterior margin of the second segment runs forward at each side, for a distance equal to nearly half the length of the first segment. Legs with the two anterior pairs quite normal but with the hind femora extremely dilated and possessing short rigid spines beneath. Wings with the radio-median cross-vein upright and placed at the middle or cell M2.

This genus shows some relationship with *Eumerus.* Although it is a very small genus, it is very widely distributed and seems to be exceedingly abundant wherever it is represented. It occurs commonly in the Ethiopian Region, Nubia, Aden, Sierra Leone, Senegal, Madagascar etc., Asia, North America, New Zealand, throughout Europe and in Eastern India.

Not much is known of the metamorphoses of this genus but I have bred our common *E. spinigera* from the rhizomes of the German iris (*Iris germanica*). The larvæ were found infesting the rhizomes in company with a few larvæ of *Eumerus amœnus** but the rhizomes, I think, had been previously attacked by the "bulb mite," (*Rhizoglyphus hyacinthi*), and in all probability the larvæ of the flies had not been attracted until decomposition had started. Mr. F.C. Willcocks also bred *S. spinigera* from larvæ found in the growing point of Banana trees infested with eelworms, and three specimens of adult *S. spinigera* exist in the collection of the Entomological Section, Ministry of Agriculture, labelled "on rotten stems of pawpaw (Tel-el-Kebir)."

According to Lundbeck, Beling has described the larva of *Syritta* as being 10 mm. in length, almost cylindrical, a little attenuated towards both ends; it is dirty yellowish, the dermis is tough and short-spinulose ; the segments with about four corrugations each ; on the ventral side are seven pairs of small prolegs with spines ; the prothoracal segment has at the front margin numerous, short, brown, recurved spines in transverse rows ; above the mouth-opening are as usual the two-jointed, antennæ-like organs ; at the posterior end of the body are on each side three filaments, the posterior one being the largest ; at the end itself is a brown, somewhat flattened posterior spiracular process ; it has a longitudinal dividing line above and below and bears the spiracles on the flat end.

The pupa is arched, rounded in front, slightly attenuated behind ; near the anterior end are two short, cylindrical, yellow anterior spiracular tubes ; they are a little distant, directed upwards and diverging, and they have the somewhat thickened apical half beset with small tubercles, partly arranged in rings ; at the posterior end is the larval posterior spiracular process, directed a little upwards. The length of the pupa is about 6 mm.

The species of *Syritta* are remarkably good and dainty hoverers and are characterised by their strongly thickened hind femora. Our common *S. spinigera* may be seen everywhere hovering over flowers and plants. I have watched the copulation of *S. subtilis* : the male hangs in the air for one minute or more over the female which is sitting on a leaf or flower, then he darts down on the female and soon after, copulation takes place, — the pair remaining in copula from three to four hours.

Only about 7 species of this genus are known from the Palæarctic region, two of which occur in Egypt.

* See p. 101.

TABLE OF EGYPTIAN SPECIES.

1 (2) Vena spuria not distinct, nearly obsolete ; hind femora with a thick and strong spine near the base ; first antennal joint mostly black ; hypopygium with lamella possessing a tuft of erect bristly hairs, (Pl. VI, fig. 1, & Pl. II, figs. 8 & 12) .... **1 spinigera** Lw.

2 (1) Vena spuria distinct and black, like the other veins ; hind femora without any basal strong spine ; antennæ yellow ; hypopygial lamella practically without any erect bristly hairs, (Pl. VI, fig. 2) .... **2 subtilis** Beck.

1. SPINIGERA LW. (Pl. VI, fig. 1 & Pl. II, figs. 8 & 12).

Lw., Stettin. Entom. Zeitg., IX. 331. (1848), Œfv. vet. Akad. Fœrh., XIV. 377.13. (1857) et Dipterenf. Südafr., 301.5. (1860) ; Schin., Verh. zool.-bot. Ver. Wien., VII. 425.2. (1857) ; Rond., Atti. Soc. Ital. Sci. Nat. Milano, XI. 25. (1868); Beck., Mitteil. Zool. Mus. Berl., II. 89.124. (1903) et Zeitschr. f. System. Hymen. u. Dipt., VII. 253.292. (1907) ; Bez., Ditt. Eritrei, II. 18.174. (1908), Ditt. raccolti d. Leo. Fea, 39. (438). 32. (1911-12), Syrph. Ethiop. Region, 5. 174., 105.111. (1915) et Syrph. æthiop. Mus. Nation. hungarici, 11 (19). 54. (1921).

SYNONYMY:— *? flaviventris* Macq., Dipt. Exot., II. 2., 75.2. (1842) ; Lw., Dipterenf. Südafr., I. 300.3. (1860) ; Schin., Nov. Reise, Dipt., 367.93. (1868).

? nigricornis Macq., Dipt. Exot., II. 2., 74.1. t. XIV. f. 4. (1842) ; Lw., Dipterenf. Südafr., I. 300.2. (1860).

armipes Thoms., Eugenies Resa, Dipt., 503.99. (1869).

spinigerella Thoms., Eugenies Resa, Dipt., 502.98. (1869).

vitripennis Big., Annal. Soc. Entom. Fr., (6) V. 248. (1885).

DIAGNOSIS:— An exceedingly common, rather small, narrow, almost bare fly, which can be at once recognised by the absence of the vena spuria, the very thick hind femora, which are serrate beneath and possessing individual strong spines and a large, stout basal spine ; antennæ dark brown.

DESCRIPTION:—Male: Face as well as the frons entirely covered with pure silvery white or pale yellowish-white dust, and with a few white hairs on the lower part of the face at the sides; face descending below the atennæ in a gentle curve to the upper mouth-edge, which is its most prominent part ; below this the face retreats to the lower mouth-edge, and thence in a straight line to the jowls ; the lower end of the vertex is thin and rather flat, and about its middle it is a little wider owing to the incurved margin of the eyes (but not so much as in *Sphærophoria*); the jowls and all the vertex are covered with pure silvery-white dust and possess a few white hairs, but the uppermost part of the occiput (immediately behind the vertex) possesses a few yellowish hairs, and the dust is usually greyish. Vertex long, possessing silvery-white dust and a few hairs on the front half of the vertical triangle, but with its hind or upper part black and bearing inconspicuous yellowish pubescence. Frons quite small, little produced, and quite free from pubescence. Eyes meet for a distance which is somewhat longer than the length of the frons, with the facets on the upper front part rather dilated. Antennæ with the two basal joints blackish or reddish-brown but with the third joint either entirely blackish or in great part black with the tip very dark reddish-brown ; arista very dark reddish-brown, gradually tapering towards the tip. All the three joints, especially the third possess exceedingly fine whitish dust.

Thorax rather dull black, thinly punctate and with the postalar calli reddish-brown or dark brown, and with traces of two lighter lines on the front part of the disc; the humeri and the sides down to the suture, as well as the pleuræ are covered with dust which varies from pure silvery-white to whitish-grey ; in the elongate hollow immediately above the postalar calli it is also greyish. The pubescence is extremely fine, short and inconspicuous, but fairly dense, even and uniformly pale. Scutellum very flat on the disc and possessing short pale hairs with a few tiny inconspicuous bristles at the tip.

Abdomen with the basal segment dull black but greyish on the two basal corners. The second segment is yellow, with a broad triangular blackish band always present on the lower margin ; the upper margin is usually yellow like the rest of the abdomen, but sometimes, it bears a small triangular

blackish band ; rarely this segment possesses a median black line, which joins the two triangular bands on the upper and lower margins, as in *S. subtilis.* The third segment is entirely yellow, except for a broad dark brown band just above the lower margin which is always yellow and shining ; sometimes this band is rather broader than usual and occupies one fourth of the length of the segment, and its upper margin is continued upwards in the middle of the segment as an obscure blackish line, which, however never reaches the shining upper margin of the segment. The fourth segment is very shining æneous-black, with its two basal corners broadly greyish and its lower end more or less deep reddish-brown. The fifth segment is very small, rounded and shining black. The pubescence on the abdomen is very inconspicuous and uniformly pale, except for a remarkable fringe of white hairs on the upper lateral margins of the second segment (where it runs forward at the sides of the first segment), which constitutes the only obvious pubescence on the abdomen. Venter transparent, blackish on the basal half of the first segment, yellow to the end of the third segment, then blackish to the tip of the genitalia. Hypopygium small with a fairly large lamella which possesses a tuft of erect, long, bristly hairs which ends beneath the base of the fourth segment. (Pl. II, fig. 12). Pubescence very short, inconspicuous and uniformly pale.

Legs black and orange; the two anterior pairs are entirely orange-yellow with the knees rather broadly pale yellow, and the coxæ and trochanters dark orange-brown; their pubescence is fairly short, whitish and inconspicuous. The very thick hind femora are entirely shining and have their basal half (or more) orange beneath, but black above, except for an orange-brown band about their middle, which is really the extension of the orange colour below ; tne distal halt is blackish above and almost entirely blackish below, except for a longitudinal orange-brown band. The femora, (Pl. II, fig.8), possess a strong and thick spine near the base, beneath, which is orange but black at the extreme tip; this tip ends in more than two minute, blunt and roundish spines; besides this large spine, the femur possesses on its basal half, beneath, from two to six much smaller black spines arranged almost in a straight line, but sometimes there is one near the large spine and two or three others in a group and situated at about the middle of the femur. The apical third of the femur is deeply serrated and the serration is on a raised ridge, behind which, near the distal end, there are three or four much longer spines. The hind tibiæ are curved and blackish, with the base light yellow, and a broad ring just after the middle yellow. The hind tarsi are darkened above and the hind coxæ (which are dark

reddish-brown, as well as the trochanters), are covered with thin whitish dust. The pubescence on the hind legs is also very short, pale and inconspicuous.

Wings pellucid with the stigma and the subcostal cell pale yellow, as well as the other veins at the base ; the vena spuria is very often obsolete, and sometimes with a very short faint line present at about its centre. Squamulæ whitish with their margins yellowish ; the thoracal pair possess long delicate white fringes which are composed of compound hairs, but the alar pair with coarser, simple whitish fringes which are only about one third of the length of those on the thoracal pair. Halteres pale yellow with the base brownish.

Female: Rather similar to the male but larger and stouter. Frons all covered with silvery white dust and some white hairs, except on a short space just before the vertex which is somewhat shining black together with the latter. The front facets of the eyes are less dilated than in the male. The second segment of the abdomen always with a central black band, which meets the upper and lower triangular bands and thus giving the yellow part of the segment the appearance of being two large spots with almost parallel margins ; these yellow spots are usually whiter towards their distal ends, but redder towards the sides. Often the triangular band at the base of the segment is absent, leaving the basal part of the segment yellow, except in the centre, owing to the central longitudinal band, which always reaches the basal margin. The extreme lower margin of the second segment is yellowish. The third segment has its lower half blackish with the broad longitudinal median band reaching the basal margin, thus leaving the two broad corners of the basal half of the segment whitish-yellow; the lower margin of this segment is yellowish-brown. The fourth segment is elongated, tapering and pointed and entirely shining black, except for two yellowish-white spots on the basal corners and the extreme tip yellowish. The first three segments are all dull except for the lower margins of the second and third segments and three spots (one in the centre near the base and two on the sides near the lower margin), on the third segment, which are shining. Venter rather more opaque and darker than in the male. Hind legs with the femora usually more orange, the spine near the base, below, much smaller and weaker than in the male, and with the hind tarsi usually much darker above.

Length from $7\frac{1}{2}$ — 9 mm.

S. spinigera is one of the commonest Egyptian Syrphids and one of the most widely distributed. My records date from January to November. It is known to occur in Africa, Asia Minor and South of Europe.

2. S. SUBTILIS **BECK.** (Pl. VI, fig. 2).

BECK., Mitteil. Zool. Mus. Berl., II. 89.125. (1903).

DIAGNOSIS:— Vena spuria distinct and black like the other veins; hind femora without any strong basal spine; antennæ entirely yellow.

DESCRIPTION:— *Male:* Very similar to the preceeding species, but easily distinguished from it by the following characteristics, the general colour of the dust and hairs on the face and frons which is greyish-yellow, and by the markings of the abdomen which are very similar to those of the female of *S. spinigera.* Vertex shining black with two roundish spots of greyish-yellow dust on the base and sides of the front ocellus. The pubescence on the thorax is much shorter than in *S. spinigera*, being hardly perceptible with a strong hand lens, and the colour of the dust on the sides of the thorax, which extends from the humeri to the sutures, is ochraceous.

The second segment of the abdomen has the markings practically identical with those of the corresponding segment of the female of *S. spinigera*, but here the whitish colour on the discal ends of the yellow markings is absent. The third segment also has its sides yellow and possesses a dull black band on its lower margin, the depth of which is equal to about one third the length of the segment ; in addition, the central black longitudinal line joins the band on the lower margin, but ends well before the basal margin, so that the two large yellow side margins meet above ; the lower margin of this segment is similar to the corresponding one in the preceeding species, but its basal corners are less broadly greyish. Venter rather opaque. Hypopygium with the lamella not possessing any tufts of erect bristles. The colour of the legs is very much like that of *S. spinigera* but the hind metatarsi are rather darkened above; the hind femora do not possess the strong basal spine below, but only a row of four or five much smaller spines on the basal half; the apical third of the hind femora is deeply serrated below as in the preceding species.

Wings pellucid, with the vena spuria as black and as distinct as the other veins ; the extreme bases of the veins, the stigma and the subcostal cell, are yellowish.

Female: Very similar to the male but the central longitudinal black band on the third segment reaches the basal margin, and the

black band on the lower margin is much deeper and occupies the two-thirds of the segment, so that the yellow markings on the upper part of the segment are isolated and much smaller.

Length from 7 to $8\frac{1}{2}$ mm.

Becker in his excellent work on the Egyptian Diptera seems to have overlooked two of the most important specific characters, which are:— the presence of the vena spuria, and the absence of the tufts of erect bristles on the lamellæ of the male genitalia. This presence or absence of the vena spuria is a very easy and reliable means of distinguishing between our two Egyptian species, a character which had previously been overlooked by Loew in his original description of *S. spinigera*, and pointed out for the first time by Thomson, and later by Bezzi. Another very reliable and equally important character is the presence or absence of the thick strong spine near the base of the posterior tibiæ, below; this character is not emphasised by Becker, probably for the reason that he used the common European *S. pipiens* (which also does not possess the spine), for comparison with his new *S. subtilis*.

This species is not uncommon in Egypt. Out of a series of fifty *Syritta*, only six turned out to be *subtilis* and the rest *spinigera*, and the six specimens (two males and four females) were all caught in my garden at Shoubrah, in the months of November, December and January. Becker has found it at Luxor and Suez.

So far this species has only been recorded from Egypt but very probably it exists in other parts of North Africa.

While this work was in the press I have obtained large series of the above species at Ramleh (Alexandria) (18.6.22); they were hovering on *Polygonum equisetifolium* on the edge of a Banana plantation. *S. spinigera* was also present, but the above species greatly outnumbered it.

10. EUMERUS MEIG.

MEIG., System. Beschreib., III. 202. CII. (1822).

SYNONYMY:—Pumilio SCHEMBRI in litt. apud. ROND., Annal. Soc. Entom. Fr., (2). VIII. 127. (1850).

Rather small to medium sized species, which bear very moderate to thick and rather coarse pubescence, and which possess on the abdomen rather peculiar pale lunules, which sometimes are obscured by a reddish, or chestnut-red ground colour.

Head broader than the thorax, with the face flat and devoid of any central knob, but bearing very dense white or yellowish dust, as well as a universal, rather long, pubescence. The lower part of the occiput is shallow, but suddenly inflated above. The vertex is very elongate and the distance between the two posterior ocelli is much smaller than the distance between these and the anterior ocellus. Eyes more or less hairy and touching for only a rather small distance in the male but always widely separated in the female, and with the facets on the front half enlarged. Antennæ rather short and with the third joint usually distinctly larger in the female. Arista inserted well before the middle of the third joint, three-jointed and quite bare.

Thorax rather quadrate, distinctly marginate, thinly or coarsly punctate, slightly arched and entirely æneous-black, but sometimes with two lighter, more or less distinct, light bands ; it may possess dense and coarse light hairs, or it may be almost bare, with very short pubescence.

Abdomen generally æneous-black like the thorax, much longer than the latter, with almost parallel sides, and is either thinly or coarsely punctate. It nearly always possesses three pairs of characteristic whitish lunules, which are sometimes obscured by the reddish ground colour (*E. muscidus*). Pubescence either very dense, or rather scarce and inconspicuous but always short and adpressed.

Legs strong, (except in *E. muscidus* where they are decidedly weak in comparison with the heavy body) blackish with yellowish markings ; all the femora are curved and rather swollen and the hind femora much more thickened and bearing on the under surface

a single row of short black spines ; usually the distal halves of the hind tibiæ are also rather swollen and curved ; generally the pubescence on the legs is rather dense and long.

Wings as a rule, rather greyish, with the radio-median cross-vein never straight or vertical, and placed at or beyond the middle of cell M2; Radius 4+5 with a loop, which, in the Egyptian species, is rarely almost as deep in the *Eristalinæ;* the turned up part of M1+2 is remarkably undulated and at its upper margin rather reflexed; the median cross-vein has its lower end much nearer the wing-margin than its upper end.

Although this genus is very distinct and sharply defined it shows affinities with several genera. The incrassate hind femora, elongate vertex, and the enlargement of the facets on the front part of the eyes, seem to show relationship to *Syritta.* It also resembles *Paragus* in such characters as the turned up portion of M1+2, the form and clothing of the face, the thorax and scutellum, and in the habits of the adults, which appear to mimic small aculeate Hymenoptera. However, the habits of the larvæ bring it in relationship with two other genera which do not seem to be represented in Egypt, *Merodon* and *Xylota.*

This genus is not a very extensive one, there being about 80 known species, of which about twenty occur in Africa and the rest in Europe (about twenty species), South Asia, Macassar, Australia and Tasmania.

Bouché in 1847 was the first to breed a species from bulbs of the common onion (*Allium Cepa*), which were destroyed by the larvæ ; these lived inside the bulbs and pupated either in the bulbs or in the neighbouring earth. Our common species here, *E. amoenus,* has also been bred from *Allium Cepa* by Mr. F. A. Willcocks of the Sultania Agricultural Society, and in the Entomological Section, Ministry of Agriculture; and *E. vestitus* from Potato tubers imported from Palestine, Cyprus and Greece, as well as being bred from Battikh (water melons), from Tul-Karam (Palestine), grapes from Mex (near Alexandria), and from the rotten stems of paw-paw from Tel-el-Kebir. I have also bred *E. amoenus* from larvæ found in the rhizomes of the german Iris (*Iris germanica*) in my garden, where a large border was almost completely destroyed by it, as well as by the larvæ of *Syrittta.* However, I believe that the damage was started by the "bulb mite" (Rhyzoglyphus hyacinthi) and not by the larvæ themselves, these merely continuing the damage, after decomposition of the tissue had been caused by "the bulb mite."

According to Bouché the larva is dirty greyish yellow, spinulose, wrinkled, and flat below; the anterior spiracles are brown; at

the posterior end there is at each side a conical, wrinkled wart or filament and below them a brown posterior spiracular process which bears the spiracles on the truncated end; this is wrinkled in its basal part. He gives the length as fully 6 mm., but Lundbeck states that Herold gives 8-11 mm. (which I think must be the correct length).

The species of *Eumerus* are curious, interesting and characteristic flies, which seem to mimic bees in their flight. They occur on various flowers in gardens and in waste places and our *E. vestitus* is nearly always found sitting on hot sandy places.

Of the genus over 40 species are known from the Palaearctic region, three of which have so far been found in Egypt.

TABLE OF EGYPTIAN SPECIES.

1	(2)	Radius 4+5 with a deep loop almost as in *Eristalis*, (Pl. VI, fig. 6)	**1 muscidus** Bez.
2	(1)	Radius 4+5 only slightly dipped.	
3	(4)	Hind metatarsi of male a little swollen and with very short inconspicuous pubescence, (Pl. VI, fig. 3, Pl. I, fig. 14 and Pl. II, figs. 3 and 10)	**3 amœnus** Lw.
4	(3)	Hind metatarsi of male very swollen, incrassate and very hairy, (Pl. VI, fig. 4).	**3 vestitus** Bez.

1. E. MUSCIDUS BEZ. (Pl. IV., fig. 6)

Bez., Syrph. æthiop. Mus. Nat. hungarici, 14. (22), 16; (24) 59. (female) (1921).

DIAGNOSIS:—Abdomen with some yellowish-red markings; legs rather simple and slender; scutellum with pale, dense pubescence; Radius 4+5 with a deep loop.

DESCRIPTION:—Female: Face and frons entirely shining æneous-black and covered with white hairs, which, on the face and the sides of the upper part of the frons, possess a silvery sheen;

the face is very short and flat; peristoma narrow; mouth small and oval; frons much narrower than in the other species; the vertex and occiput are rather puffed out and possess pale greyish pubescence. Eyes entirely covered with dark grey hairs, which are rather long and tufted. Antennæ rather short, with the two basal joints small, black and the third joint medium, rounded, rusty-red, and possessing on the outside, some light, ashy-coloured dust; arista blackish, quite bare and thin.

Thorax longer than wide, entirely æneous-black, rather shining and finely punctate ; it possesses the usual pair of whitish lines on the front of the disc, which are rather inconspicuous and scarcely extend beyond the middle; the pubescence on the disc, as well as on the side margins and the pleuræ, is fairly long, pale and even ; scutellum rather shining æneous-black, punctate with the lower margin flattened and somewhat blunt.

Abdomen elongate, rather flat, but gradually tapering towards the apex, where it is conical; it is shining æneous-black, except for the following markings:—two large yellowish-red spots on the sides of the second segment, two much smaller and fainter ones on the side margins near the apical corners of each of the third and fourth segments respectively, and the apex of the fifth segment which is also yellowish-red. The second segment possesses two white lunules which are indistinct and obscured by the large reddish markings in my type specimen; these, however, Bezzi describes as "oblique, separated, but not dilated in the middle." The third and fourth segments each possess two white lunules which are distinct only in certain lights; the lunules on the third segment are oblique, slightly bent in their middle and with their upper ends rounded, well separated and almost touching the basal margin of the segment; the lunules on the fourth segment are distinctly wider, with their upper ends rather more widely separated; their upper three-fourths run parallel with the side margins of the segment, then they suddenly bend outwards at right angles, thus their lower fourth being parallel with the lower margin. Pubescence on the abdomen is entirely whitish, dense and rather short. Venter shining æneous-black, but with the yellowish-red markings of the dorsum showing through by transparency; pubescence very pale and rather short. Ovipositor very small, retracted and with a small tuft of rusty-yellow hairs.

Legs shining blackish but with the knees and the basal halves of the tibiæ yellow. All the tibiæ and the tarsi bear strong spurs and the hind femora, which are weak, possess from seven to eight strong bristles on the ventral surface near the apex.

Wings transparent, colourless, with the nervures strong and

black, except at the base where they are brown, and the subcosta yellowish; Radius 4+5 is much more dipped than in the other species of this genus, nearly as much as in *Eristalis;* the stigma is short, small and only slightly darkened. Squamulæ with their fringes white, and their margins yellow. Halteres white.

Length, about 13 mm.

This species is provisionally included in the list of Egyptian Syrphidæ, but hitherto it has only been recorder from Romani where a single female was captured by A.W. Boyd on 23.9.1916, the specimen being in the collection of the Entomological Section, Ministry of Agriculture. This specimen lacks both antennæ, consequently the above description of them has been burrowed from Prof. Bezzi's type. The only other female known, from Tatahonina (North ? Africa), belongs to the Budapest Museum, from which Prof. Bezzi made his original description. Our specimen from Romani, however, seems to be different from the type as regards the colour of the abdomen ; in the original description : "Abdomen "elongatum, planum sed conicum, basi thorace non latius, apicem "versus valde attenuatum, totum nigroæneum nitidum, passim "paullo purpurascens; segmentum primum immaculatum, secundum "lateribus paullo et obscure rufescèntibus, lunulis duabus albis, obliquis, separatis intus rotundato-dilatatis et semper sat distantibus; quintum breve, immaculatum..."

Further knowledge of this curious and interesting fly is much to be desired, as it represents a distinct group of this genus owing to its comparatively slender hind femora, and its wing venation; moreover nothing is known about its habits. The male is unknown.

2. E. AMŒNUS LW.

(Pl. IV, fig. 3, Pl. I, fig. 14 and Pl. II, fig. 3 and 10).

Lw., Stettin. Entom. Zeitg., IX. 132. 15. (1848); Schin., Verh. zool.-bot. Ges. Wien, VII. 429. 21. (1857); Beck., Mitteil. Zool. Mus. Berl., II. 87. 122. (1903); Beck., Bez., Kert. u. Stein, Katal. Palæarkt. Dipt., III. 133. (1907) ; Kert., Catal. Dipteror., VII. 313. (1910).

DIAGNOSIS:—Abdomen without any yellowish-red markings; legs with the hind femora bearing two rows of spines at their distal ends beneath; hind metatarsi of male a little swollen,

but with very short inconspicuous pubescence; scutellum shining æneous, almost free from pubescence; Radius 4+5 only slightly dipped.

DESCRIPTION:—Male: Face and frons shining black, but entirely covered with dense silvery-white dust and some white hairs, amongst which are intermingled yellowish ones. Jowls, as well as most of the occiput, covered with white dust and whitish-grey pubescence; the pubescence on the very shallow occiput is extremely short. Vertex very long and puffed out above and pointed in front, very shining æneous-black and sparsely punctate, with a hair arising from each dot; its pubescence is rather long, tawny-yellow on the extreme front, blackish about the ocelli and again tawny-yellow on the back half; the extreme tip of the vertical triangle is usually covered with yellow dust and the anterior ocellus is much further from the two posterior, than the two latter are from each other. Eyes touching for a distance which is shorter than the length of the frons (for about six to seven facets), covered with white, very inconspicuous hairs.

Antennæ with the two basal joints black and the third reddish black but blackish above; most of the second and all the third joints are covered with shining whitish dust and in addition the second joint bears a short greyish-white pubescence; arista three jointed, about twice the length of the third joint of the antennæ with its apical half very slender; its two basal joints are deep reddish-brown, while the long third joint is entirely blackish.

Thorax very shining, blackish æneous, and rather densely punctate, with a pair of whitish bands in front, which are inconspicuous and scarcely extend beyond the middle ; the humeri are rather swollen and prominent, with a distinct and deep posthumural suture; pubescence very short, pale and inconspicuous, except for a tuft of rather longer whitish hairs on the suture. Scutellum also very shining æneous, densely punctate and with a similar pubescence; its margin is serriform and flattened, except at the basal corners; the margin appears as if it might be composed of about twenty short stout spines which had coalesced except at their tips.

Abdomen about twice as long as the thorax and entirely shining æneous-black, with three pairs of whitish lunules, one pair on each of the second, third and fourth segments respectively; it is also densely punctate like the thorax with short pale pubescence, which is rather inconspicuous, except for a tuft or fringe of whitish hairs on the basal corners on the sides of the second segment, which is not unlike the fringe in *Syritta*. Venter inpunctate, reddish-brown near the base, opaque-grey, but with a fairly

broad darker stripe in the centre; it is practically free from, pubescence except on the central darker stripe, where it is whitish and sparse. Hypopygium fairly large, shining æneous and brown and possessing rather sparse pale pubescence.

Legs black with the extreme tip of the anterior femora and the base of all the tibiæ brownish-yellow, or yellow, as well as the middle metatarsus, and the tips of the other joints of the middle tarsi, and all the tips of the front tarsi; the three pairs of femora are rather swollen; the hind pair is much more swollen and in addition its lower distal half bears two rows of about eight sharp black spines, between which the tibiæ can fold back; the hind metatarsi are swollen, a little less than the tibiæ and more than the following joint of the tarsus, and there is little gradation between these three joints, so that the hind legs appear unusually thick and clumsy. The joints of all the tarsi bare short, but distinct, spurs and those on the hind pair are rather hidden by the dense pubescence. The pubescence on the upper part and sides of the anterior pair of legs is rather short, pale and inconspicuous, while they are quite bare on the under-surface; on the hind legs it is rather longer, denser, erect and whitish in colour; on the base of the upper part of the tibiæ on the inside there is a fringe of about six or seven white bristles.

Wings rather smoky-greyish; subcostal cell darkish-brown and Radius 4+5 is slightly dipped. Squamulæ rather opaque and whitish, with a yellowish margin; the alar pair are small and bear simple whitish fringes; the thoracal pair are much longer and also possess white fringes which are much longer and composed of compound hairs as in *Syritta.* Halteres yellow, with a brown base.

Female: Very similar to the male but usually larger. The frons is not so shining and is entirely black, except for two thin lines of whitish-grey dust on its side margins, which extend from the sides of the face to the lower margin of the vertex, where they end abruptly; vertex very broad. The punctation on the frons, vertex, thorax and abdomen is rather coarser in the male and the pubescence on the thorax and abdomen is denser. The apex of the abdomen is more pointed.

Length from 7 to 10 mm.

E. amœnus is the commonest species of this genus in Egypt, and may be found from October to June throughout the Nile Valley from the Mediterranean coast to Upper Egypt and in the Fayum. It is rather common in the Mariout district. It is known to occur in North Africa, Asia Minor and South Europe.

3. E. VESTITUS **BEZ.** (Pl. VI, fig. 4).

Bez., Ditt. raccolti d. Leo. Fea, Ia, 43. (442). 37. (1912), Syrph. Ethiop. Region, III. (1915), et Syrph. æthiop. Mus. Nat. hungarici, 16. (24). (1921).

DIAGNOSIS:— Radius 4+5 only slightly dipped; hind metatarsi of male very swollen, incrassate and very hairy.

DESCRIPTION:— *Male:* The face and frons, which are short and flat, are entirely covered with dense silvery-white dust and hairs like in *E. amænus;* jowls and occiput also resembling these of the latter; vertex very elongate, rather puffed out above and very pointed in front; it is densely punctate and covered with tawny-yellow dust, except about the anterior and the two posterior ocelli and on the punctations of the back, where it is rather shining æneous-black; its pubescence is rather long and consists of a few white hairs on the extreme narrow front, blackish hairs about the ocellar triangle and pale tawny-yellow hairs on the hinder third. Eyes moderately covered with short, pale and inconspicuous hairs. Antennæ with the third joint rather truncate on the outer side and usually blackish, but sometimes rather reddish or reddish-brown; the three joints possess some whitish dust and in addition the two basal joints possess a few short pale and erect hairs beneath; arista with the two very inconspicuous basal joints blackish and the rather thin, long, third joint also black, but reddish brown at the base. Thorax coarsely punctate, somewhat shining, and covered with yellowish-grey tomentum, except for some characteristic, more shining, and bare areas above the suture; this tomentum consists of two thin median longitudinal lines and two fairly large round areas on the outside of each of these two lines, above; the dust is denser on the base, side and lower margins of the thorax, as well as on the rather prominent humeri and in the sutures; the pubescence is greyish-tawny, rather short but erect on the disc, and longer and yellower on the side-margins and below the postallar calli; the pleuræ are densely but not coarsely punctate, also covered with greyish dust and possess greyish hairs; there is a remarkable fringe of shining whitish grey hairs on the posterior margin of the mesopleuræ and a less dense and shorter fringe on the pteropleuræ. Scutellum less

coarsely punctate and consequently more shining æneous than the thorax, with its lower margin covered with dirty white dust ; its pubescence is longer than that of the thorax and consists of dark grey or tawny hairs on the disc and longer, very characteristic tawny-yellow bristly hairs on the lower margin.

Abdomen black, coarsely punctate, mostly dull and almost entirely covered with grey and tawny-yellow dust, which is much thicker on the two pairs of lunules, (one pair on each of the second and third segments), and on the apical half of the fourth segment, as well as on the lower margin of the third segment. The lunules on the second and third segments are fairly large and conspicuous with black punctations, the pair of lunules on the second segment being narrower and their inner ends more remote from each other than those on the third segment; the fourth segment is covered with greyish-yellow dust, which is coarsely punctate with black, except for the broad basal corners which are free from dust, as well as a thin median transverse basal line which is continued in another thin vertical, median line downwards to about one-third the length of the segment ; in other words, the fourth segment possess two broad lunules, the lower margins of which are indistinct owing to the dust entirely covering the lower part of the segment, although the dust on the lunules is paler and brighter. Pubescence on the abdomen is fairly dense and short, mainly following the ground colour, but with a few rusty-yellow hairs on the disc, except for a fringe of grey hairs on the puffed out basal corners of the second segment, which is the broadest part of the abdomen. Hypopygium asymmetrical and black.

Legs black, with the knees of the two anterior pairs broadly yellow, also the extreme base of the posterior tibiæ, the ventral side of the very swollen hind metatarsi and all the front tarsi are yellow. The posterior femora are very swollen and bear two rows of black spines on their lower distal ends ; the hind tibiæ are also rather swollen ; the hind metatarsi are about as broad as the broadest part of the tibiæ, triangular, flat below, and ending above in a sharp ridge. The middle tibiæ have distinct spurs and the four basal joints of all the front, middle and hind tarsi are spurred ; these spurs are usually yellow on the front legs and black on the middle and hind legs. The pubescence on the front legs is fairly long and whitish but occurs only on the upper surface and sides ; on the hind femora and tibiæ the pubescence is also whitish, but more erect, longer and rather tufted. The four basal joints of the hind tarsi bear on their lower surface and sides very short but erect and tufted rusty-yellow

hairs ; the pubescence on their dorsal surface is mainly blackish, much longer, and the characteristic metatarsus bears on its sharp ridge a remarkable fringe of long, black, erect and tufted hairs.

Wings pellucid, rather greyish, with the base of the veins light brown and the subcosta and stigma brownish ; Radius 4+5, slightly dipped. Squamulæ and their fringes white, and their margins yellow. Halteres yellowish-white.

Female: Very similar to the male but the dust and pubescence on the frons and vertex is usually yellowish or even tawny-yellow. The hind metatarsi, although nearly as swollen as in the male, are more rounded and do not possess that remarkable sharp dorsal ridge with its characteristic black fringe.

Length from 8 to 9½ mm.

E. vestitus was originally described from West Africa (Rio Cassine, Portugese Guinea), where it lives together with a closely allied species: *E. obliquus.* Bezzi (1912)* states that he had received from Becker specimens from Egypt of the species described above (*vestitus*) which were erroneously classified as *obliquus.* Moreover Becker (1902)** describes the female of *E. vestitus* under the name of *obliquus* and this description corresponds entirely with that of *vestitus*

E. vestitus is not a common species in Egypt and is rather local. It is a very interesting fly owing to the fact that it closely mimics the flight of Hymenoptera, and even to a practised eye it is a very difficult matter to distinguish them. I have watched it at Marg flying above *Polygonum equisetifolium;* it does not remain motionless for a second, but continuously moves and vibrates its wings ; it rests on the flowers for a short time and suddenly darts away and sits on the sand and then back again on the flowers, repeating this performance over and over again.

There is no doubt that the larva feeds on decaying vegetable matter.***

I have captured the adult at Shoubra, Marg, Kerdacé, Wadi Hoff, Mariout, Fayoum and I believe it to be more widely distributed. My dates extend from April to October.

It is known to occur in Syria, Greece, West Africa and no doubt it occurs in many other localities, but, owing to its close resemblance to *E. obliquus,* probably it occasionally has been confused with the latter.

*M. Bezzi: Ditt. raccolti d. Leo. Fea, 43. 44. (442). (443). 37. (1912).
** Th. Becker: Mitteil. Zool. Mus. Berl., II. 87. 123. (1902).
***Vide p. 104.

CERIOIDINÆ.

Medium sized or moderately large, bare and elongate flies which are exceedingly like the *Conopidæ* and some of the smaller wasps (*Vespidæ*). They are characterised by the antennæ which are very often placed on a long petiole and which are elongate, porrected and with a terminal style, and by the wings which possess usually the costal border as far the vena spuria darkened, and an *Eristalis*-like loop in Radius 4+5, from the bottom of which a peculiar veinlet almost bisects the cell beneath (R5) as in the *Microdontinæ ;* Radio-median cross vein placed after the middle of cell M2.

There is so far only about 70 species of this very distinct and sharply defined group known. They seem to be chiefly represented in Central America and Africa but they also occur in Europe, North America, Tasmania, India, Jamaica, Asia Minor and Japan.

Very little is known about the metamorphoses of this group. Verrall states that *C. conopsoides* has been bred from flowing sap, but I strongly suspect them to posses some relation with Hymenoptera, especially ants.

11. CERIOIDES ROND.

ROND., Annal. Soc. Entom. Fr., (2). VIII. 211. (1850).

SYNONYMY:— Ceria FABR., Syst. Entom., IV. 277. (1794), (*praecocc.* SCOP., 1763).

Sphecomorpha ROND., Annal. Soc. Entom. Fr., (2). VIII. 212. (*Sphiximorpha*) (1850).

Sphiximorpha ROND., Dipterol. Prodr., I. 55.3. (1856).

Spiximorpha ROND., Dipterol. Prodr., II. 12. (1857).

Head rather flattened, broader than the thorax with the face almost straight in front, but descending below the eyes and somewhat produced at the front mouth-edge. Eyes touching in the male, but well separated in the female. Antennæ elongate and sometimes placed on a more or less long petiole or stalk; the first joint is long and slender but the second and third joints are shorter, about equal in length and the two together are about as long as the first joint; these two joints form together an elongate oval mass, and the third joint bears a terminal style.

Thorax rather elongate, quadrangular, rather thinly rugose, and always possessing yellow spots. Scutellum semicircular, more or less yellow.

Abdomen elongate, cylindrical, contracted, more or less wasp-shaped at the base, and bearing yellow bands or markings. Legs moderately strong with the femora somewhat thickened and the tibiæ sometimes subclavate.

Wings with a distinctive and peculiar venation; Radius 4+5 has a deep loop about the middle of cell R5 at the bottom of which loop arises a veinlet descending about half way or less across cell R5; radio-median cross-vein possesses the costal border as far as the vena spuria darkened and also a darkened border along Cubitus 2.

The larva according to Dufour, who has described and figured it (as well as the pupa) (Ann. Soc. Ent. France, 2 V., 19, Pl. I, f. 1-6. 1847) lives in the sap of diseased trees such as Elms (*Ulmus*). Schiner also states that he has bred an European species *C. conopsoides*(?) from decaying poplars (*Populus*).

1. C. VESPIFORMIS **LATR.** (Pl. V, fig. 7).

Latr., Gen. Crust. et Ins., IV. 328. (*Ceria*) (1809) et Consid. génér., 443 (*Ceria*) (1810); Meig., System. Beschreib., III. 161. 3. (*Ceria*) (1822) et VI. 348. (*Ceria*) (1830); Macq., Suit. à Buff., I. 484. 3. (*Ceria*) (1834); Lw., Neue Beitr., I. 7. 2. (*Ceria*) (1853); Schin, Verh. zool.-bot. Ver. Wien, VII. 447. 4. (*Ceria*) (1857) et Nov. Reise, Dipt., 369. 104. (*Ceria*) (1868); Rond., Dipterol. Prodr., II. 214. 2. (*Ceria*) (1857); Palma, Annal Accad. Aspir. Natur. Napoli, (3). III. 38. 2. (*Ceria*) (1863); Rœder, Berlin. Entom. Zeitschr., XXXI. 73. (*Ceria*) (1887); Verr., Brit. Fl., VIII., Catal. Syrph., 119. (*Ceria*) (1901).

SYNONYMY:—clavicornis Coqueb. (*nec.* Fabr.), Illustr. Icon. Insect., 102. t. XXIII. f. 8. (*Ceria*) (1804).

scutellata Macq., Dipt. Exot., II. 2, 10. 1. t. I. f. 1. (*Ceria*) (1842) et Explor. scient. de l'Alegrie, Zool., III. 463. 148. (*Ceria*) (1849); Saund., Trans. Entom. Soc. Lond., IV. 66. (*Ceria*) (1845).

intricata Saund., Trans. Entom. Soc. Lond., IV. 64. 1. t. IV. f. 2, 2a. (*Ceria*) (1845); Walk., List Dipt. Brit. Mus., III. 538. (*Ceria*) (1849).

conopsiformis A. Costa, Atti. R. Accad. Napoli, (2) V. 25. 50 (*Ceria*) (1893) *lapsus.*

DIAGNOSIS:—A quaint and beautiful fly, wasp-like in appearance, easily distinguished from any other Egyptian member of the family by its porrected antennæ, which are placed on a long and strong petiole and which bear a terminal style, and by its peculiar wing venation.

DESCRIPTION:—Male: Head rather flattened, broader than the thorax; face and frons entirely yellow, rather shining and quite bare, with a dark brown stripe running down the centre of the face and extending from the base of the antennal petiole to the upper mouth edge, but not quite reaching the latter; there are also two small triangular dark brown markings on the frons, one on each side of the petiole; the jowls are black and this colour extends to the eyes; proboscis brown; the lower part of the occiput is inflated and yellow, in the middle black, and the occipital upper border is again much produced and bright yellow; vertex inflated and bearing the three ocelli close together; eyes dark reddish-brown, bare, meeting for a distance which is a little less than

the length of the vertex; antennal petiole long and strong, blackish, except at the extreme base and apex where it is light brown; antennæ dark reddish-brown, almost blackish, with the basal joint elongate and thin, and the second and third joints much shorter, inflated, and forming together an elongate oval mass; the third joint is shorter than the second with a terminal thin, acute style.

Thorax dull black, except the humeri bright yellow and a spot immediately behind the suture on the side-margin also yellow; the pleuræ are blackish, but with a large, elongate and conspicuous yellow spot occupying all the mesopleura and most of the sternopleura; scutellum semicircular and entirely yellow.

Abdomen elongate, cylindrical and much narrower at the base; it is somewhat dull, but shining in places and thinly rugose; the basal segment is long, dull black but with the basal corners which are very inflated, broadly yellow; there is a slight depression at about the middle of this segment and its lower margin is produced in the centre; the second, third and fourth segments are black except for a conspicuous and very uniform yellow band, more like a ring, on the lower margin of each segment; the band on the fourth segment is a little deeper than the one on the others; each of these three segments possess two peculiar longitudinal depressions, one on each side of the middle; the fifth segment is very short, entirely black and rather shining. Venter brown, but yellow at the base, opaque and shining and with the yellow rings on the dorsum continuing around each segment. Hypopygium very small and reddish-brown. Legs mostly yellow but all the coxæ and trochanters brown; front, middle and hind tarsi brown and the tibiæ possess a brown ring near the apex; the hind femora are rather thickened and their apical thirds brownish; they possess two inconspicuous rows of minute black spines on their ventral surface near the apex, between which the tibiæ fold back; the hind tibiæ are subclavate and their apical thirds are also brownish; the legs are entirely bare except for a very minute yellow and inconspicuous pubescence beneath the hind tarsi.

Wings with almost all the upper half brownish and the lower half pellucid; the brown colour extends from the costa to the vena spuria; there is also a brownish border along Cubitus 2, dilated at the end and extending along Cubitus 1, Media 3 and across cell R; the veinlet at the bottom of the loop in Radius 4+5 is short. Squamulæ very small, pale yellow with very short whitish fringes. Halteres yellow.

Female:—Similar to the male; frons with its upper half black and its lower half yellow and with a triangular dark brown mark-

ing in the centre, the top angle of which reaches the darkened base of the petiole

Length of body excluding the antennæ: about 9 mm.

Length of body including the antennæ: about 11 mm.

This very interesting species is very rare. I possess only two individuals, one male and one female, given me by Mr. F.C. Willcocks and labelled "Ghezireh 1906."

It is known to occur in Central Europe, North Africa and Asia Minor.

INDEX

PLATE I.

Fig. 1. Diagram of *Syrphus*: *A.* = Antenna, *Ar.* = Arista, *O.* = Ocelli, *E.* = Eye (compound), *F.* = Frons, *V.* = Vertex, *Oc.* = Occiput, *H.* = Head, *Th.* = Thorax, *Sc.* = Scutellum, *Ab.* = Abdomen, *h.* = Haltere, *S.* = Squamula, *i—vii.* = 1st to 7th abdominal segments, *I, II, III* = Fore, Middle and Hind Legs, *Fe.* = Femur, *Ti* = Tibia, *Ta* = Tarsi (five), *Cl.* = Claw, *Pa.* = "Pad" or Pulvillus, *Hu.* = Humerus, *Su* = Suture, *P.C.* = Post Alar Callus.

1 = Costa,
2 = Subcosta (Mediastinal or axiliary),
3 = Radius 1 (1st longitudinal or Subcostal),
3 = Radius 2 + 3 (2nd longitudinal or Radial),
5 = Radius 4 + 5 (3rd longitudinal or Cubital),
6 = Media 1 + 2 (4th longitudinal or Discal),
7 = Media 3 + Cubitus 1 (5th longitudinal or Postical),
8 = Cubitus 2 (5th longitudinal or Anal cross-vein),
9 = Annal 2 (6th longitudinal or Anal),
10 = Anal 3 (Axillary),
11 = Vena Spuria or false vein.
St. = Stigma,
12 = Humeral (Basal Costal) cross-vein,
13 = Radio-median (discal or middle) cross-vein,
14 = Media 3 (Lower or small) cross-vein,
15 = Cubitus 1 cross-vein,
16 = Median (Lower marginal or postical) cross-vein,
1st C. = First Costal (basal costal or Mediastinal cell),
2nd C. = Second Costal (Mediastinal cell),
Sc.c. = Subcostal (third costal cell),
R1 = Radius 1 (Marginal cell),
R3 = Radius 3 (Submarginal or Cubital cell),
R5 = Radius 5 (Subapical or 1st posterior cell).
M2 = Media 2 (Discal or 2nd posterior cell),
Cu1 = Cubitus 1 (3rd posterior cell),
R = Radius (Upper, 1st basal or radical cell).
M = Media (Middle, and basal or radical cell).
A1 = Anal 1 (Lower 3rd basal, radical or Anal cell).
A2 = Anal 2 (Axillary cell),
Alu = Alula (Axillary lobe).

Fig. 2. Side view of *X. ægyptium*: *Fr.* = Frons, *F.* = Face, *G.* = Gena or cheek, *M.* = Mouth, *Um.* = Upper Mouth-edge, *Th.* = Thorax, *S.* = Suture, *W.* = Wing, *Sc.* = Scutellum, *Bs.* = basal segment of abdomen, *A.B.C.* = Front, Middle and Hind Legs, 1 = Prothorax, 2 = Mesopleura, 3 = Pteropleura, 4 = Sternopleura, 5 = Metapleura, 6 = Hypopleura, 7 = Plumula?

Fig. 3. Hypothetical primitive type of wing venation with the named cross-veins added (after Comstock & Needham).

Fig. 4. Wing of *Tipula* (after Comstock & Needham).

,, 5. *Paragus ægyptius*, head front view.

,, 6. *Paragus tibialis*, head front view.

,, 7. *Paragus ægyptius*, head in profile.

,, 8. *Sphærophoria flavicauda*, head in profile.

,, 9. *Syrphus corollæ*, head in profile.

,, 10. *Eristalis tæniops*, head in profile.

,, 11. *Lasiophthicus albomaculatus*, head in profile.

,, 12. *Mesembrius capensis*, head in profile.

,, 13. *Eristalis tenax*, head in profile.

,, 14. *Eumerus amœnus*, head in profile.

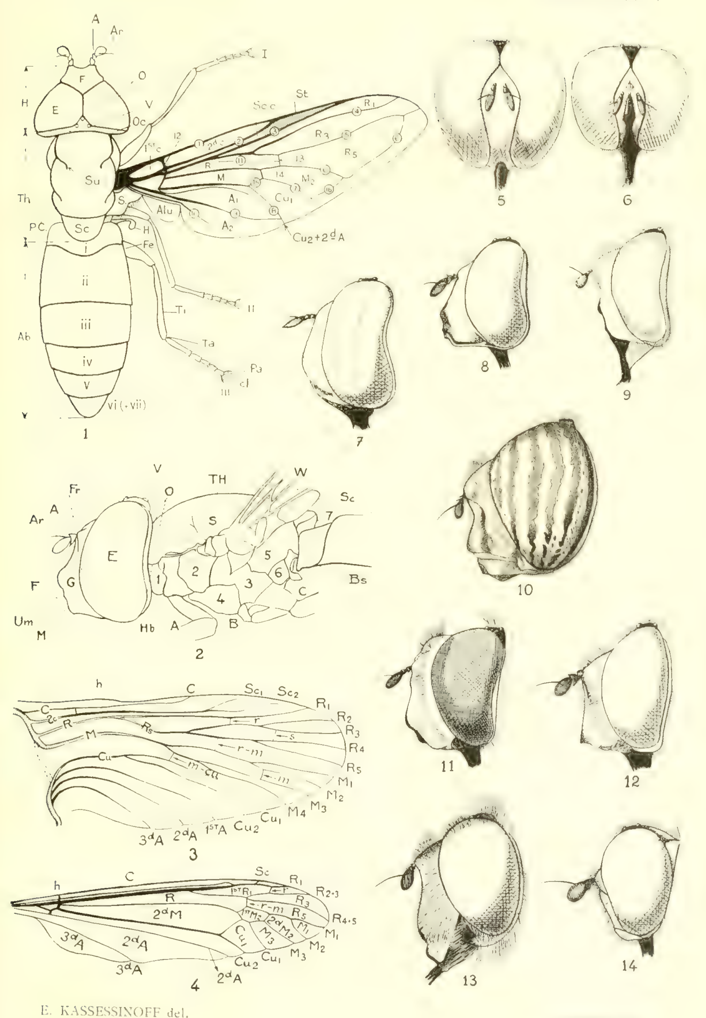

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PLATE II.

Fig. 1. *Eristalis tenax*, wing.

" 2. *Eristalis tæniops*, wing.

" 3. *Eumerus amœnus*, wing.

" 4. *Mesembrius capensis*, hind leg, male.

" 5. *Xanthogramma ægyptium*, hind leg, male showing spine on trochanter.

" 6. *X. ægyptium*, left front leg of male, showing bicuspidate inner claw.

" 7. *Mesembrius capensis*, hind tibia and basal tarsus of male showing globiferous hairs.

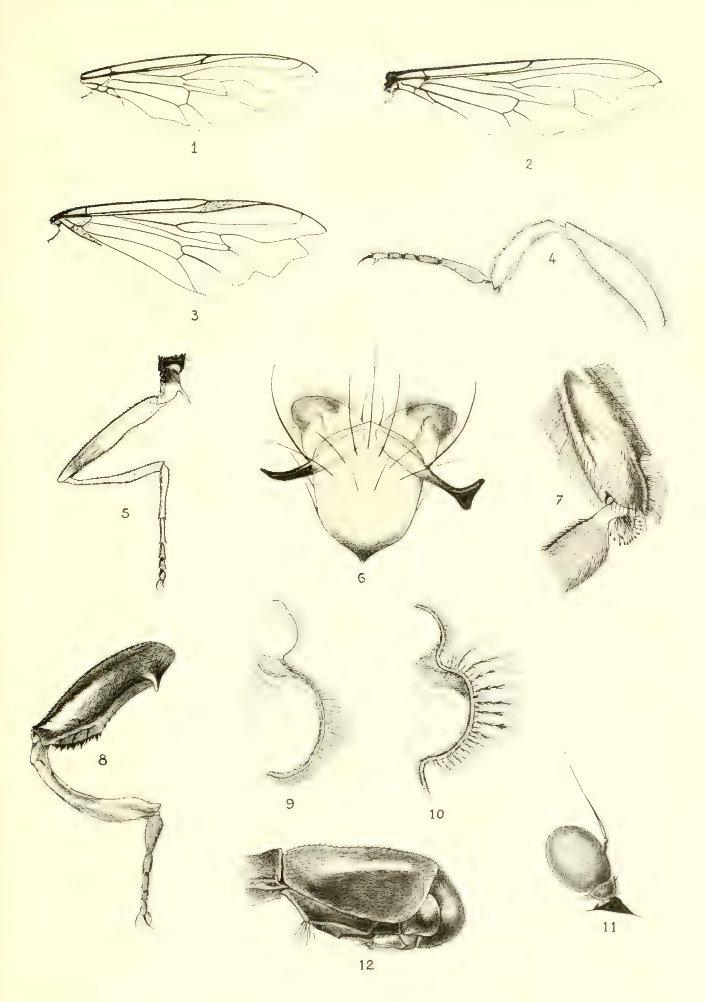
" 8. *Syritta spinigera*, hind leg, male.

" 9. *Mesembrius capensis*, squamula.

" 10. *Eumerus amœnus*, squamula.

" 11. *Eumerus amœnus*, antenna.

" 12. *Syritta spinigera*, hypopygium.



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Photochrom Lyon

PLATE III

Fig. 1. *Paragus ægyptius* Macq., male.

" 2. *Paragus tibialis* Fall., male.

" 3. *Paragus tibialis* Fall., *var. hæmorrhous* Meig., abdomen, male.

" 4. *Paragus tibialis* Fall., *var. trianguliferus* Zett., abdomen, male.

" 5-6 *Paragus ægyptius* Macq., male *varieties*, abdomens.

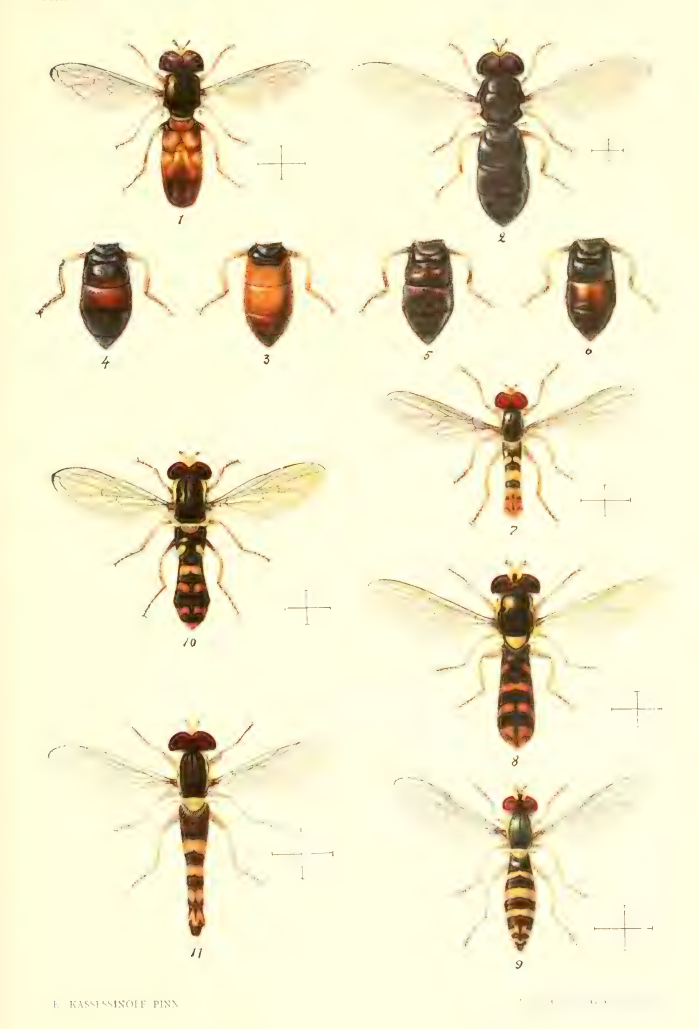
" 7. *Sphærophoria flavicauda* Zett., male (pale form).

" 8. *Sphærophoria flavicauda* Zett., female (intermediate form).

" 9. *Sphærophoria scripta* L., female.

" 10. *Sphærophoria flavicauda* Zett., *var. calceolata* Macq., male (dark form).

" 11. *Sphærophoria scripta* L., male.



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PARAGUS, SPHAEROPHORIA

PLATE IV.

Fig. 1. *Syrphus auricollis* Meig., female.

» 2. *Syrphus corollæ* F., male.

» 3. *Syrphus corollæ* F., female.

» 4. *Lasiophthicus albomaculatus* Macq., male.

» 5. *Lasiophthicus pyrastri* L., female.

» 6. *Syrphus balteatus* Deg., male.

» 7. *Xanthogramma ægyptium* Wied., male.

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SYRPHUS. LASIOPHTHICUS. XANTHOGRAMMA

PLATE V.

Fig. 1. *Eristalis tenax* L., male.

» 2. *Eristalis tæniops* Wied., male.

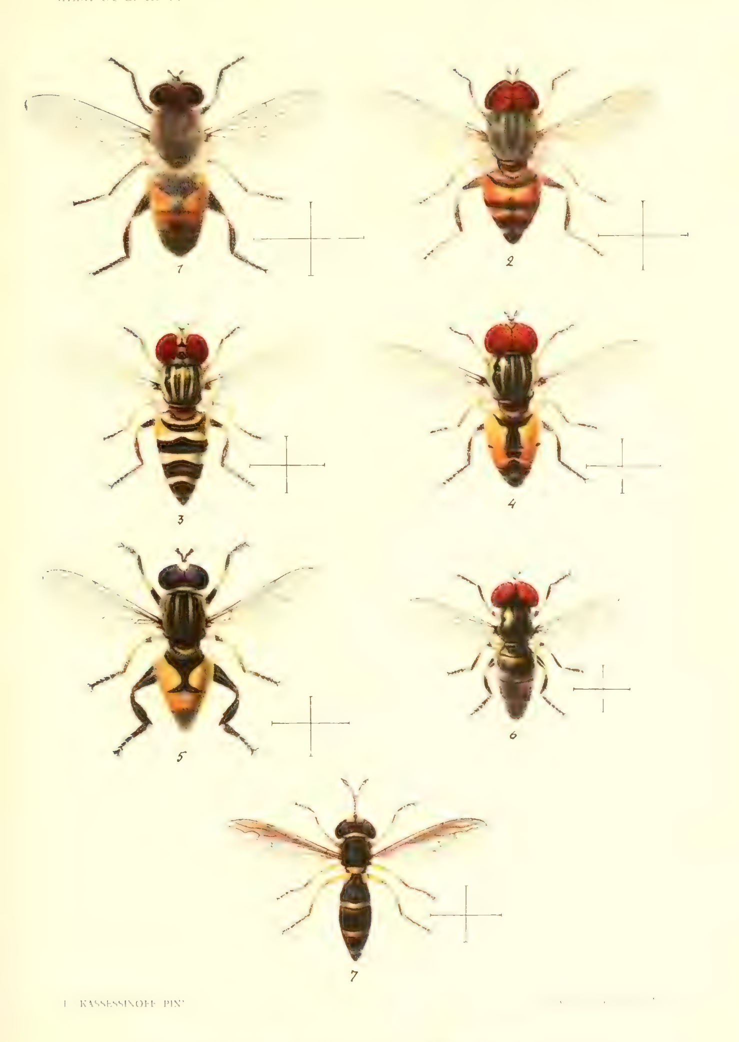
» 3. *Eristalis quinquelineatus* F., female, *var. tabanoïdes* Jaën.

» 4. *Eristalis quinquelineatus* F., male.

» 5. *Helophilus (Mesembrius) capensis* Macq., male.

» 6. *Eristalis æneous* Scop., male.

» 7. *Cerioides vespiformis* Latr., female.



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ERISTALIS HELOPHILUS. CERIOIDES

PLATE VI

Fig. 1. *Syritta spinigera* Lw., male.

» 2. *Syritta subtilis* Beck., male.

» 3. *Eumerus amœnus* Lw., male.

» 4. *Eumerus vestitus* Bez., male.

» 5. *Pseudodoros nigricollis* Beck., male.

» 6. *Eumerus muscidus* Bez., female.

KASSESSINOFF PINX

SYRITTA. EUMERUS. PSEUDODOROS

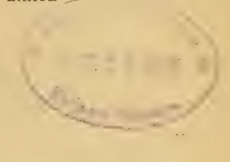
MÉMOIRES

DE LA

SOCIÉTÉ ROYALE ENTOMOLOGIQUE D'ÉGYPTE

FONDÉE LE 1er AOUT 1907

Fatti non foste a viver come bruti,
Ma per seguir virtude e conoscenza.
DANTE



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LE CAIRE
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Introductory Note

The following account of the Trypaneidae forms Part II of my Monograph of Egyptian Diptera, the 1st Part of which has already appeared (1923). The sequence in which the families have been dealt with is not intended to show any natural relationship but is largely a matter of convenience. In addition the Family Trypaneidae has been chosen because of the great economic importance of some of its members. *Ceratitis capitata*, which is one of the most dangerous pests of the world is already, unfortunately very common in this country, but *D. oleae*, *Myiopardalis pardalina* and *Chaetodacus zonatus*, the descriptions of which are included in this Monograph, are not yet in this country, but may appear at any moment in spite of the precautions which are being taken to prevent their introduction.

The number of the species of Trypaneidae recorded from Egypt in 1919 was 29 but it is now increased to 38 and as this increase only represents the results of three years work it is probable that many other species still await discovery, particularly in the more remote and inaccessible parts of Egypt. It is to be regretted that so little information is available about the biology and bionomics of most of the species; as, however it is comparatively easy to breed most members of this group by collecting flowerheads, etc. it is hoped that the greater facility to identify specimens, here provided, will encourage other workers to assist in filling the gaps in our knowledge.

My best thanks are due to Professor Dr. Bezzi of Turin, whose unfailing willingness to put his great experience, knowledge and ability at my disposal has made my work much easier and has helped me to settle points which otherwise would have remained in doubt. Professor E. Hindle of the School of Medicine and Mr. T. W. Kirkpatrick and Mr. C. B. Williams of the Ministry of Agriculture have also assisted me in many ways and their help is most gratefully acknowledged. My thanks are also due to Dr. Enderlein of the Berlin Museum for the loan of the type speci-

mens of *Dacus semisphaereus*, Beck. and *D. annulatus* Beck. and to Dr. Czerny of the Vienna Museum for the loan of the type of *Metaspheniscus gracilipes* Lw. Finally I would like to record my indebtedness to Mr. Eugène Kassessinoff whose beautiful and accurate drawings show many facts which it is difficult to express in words.

H. C. E.

Cairo, April 10th, 1924

MUSCIDÆ

HOLOMETOPA

ACALYPTERÆ

Trypaneidae

GENERAL CHARACTERS OF THE FAMILY

HEAD

The chaetotaxy of the head and thorax is one of the most important characters in this family, especially the position of the bristles, their number and form.

Head narrower than the thorax, broad or narrow, widened below or not ; the proportions between the breadth, height and depth is often important in distinguishing the genera. Frons without any distinct vibrissae and bearing a row of bristles on its lateral borders known as the *fronto-orbital bristles* (*or*). These are variable in number and form and are divided into *superior fronto-orbitals* (*s.or.*), consisting of 1 or 2 pairs bent backwards and *inferior fronto-orbitals* (*i.or.*) consisting of from 1 to 4 pairs bent forwards or outwards.

Face usually flattened, sometimes concave or somewhat swollen in the middle, retreating below or not, more or less elongated and sometimes with antennal furrows.

Epistoma prominent or not.

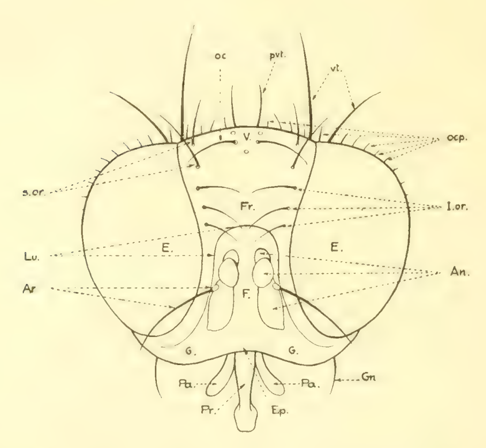
Cheeks (genae) broad or narrow, usually bearing 1 bristle, known as the *genal bristle*, which when present is more or less developed.

Occiput sometimes swollen below and almost always with a row of bristles, known as the *occipital row* (*ocp.*) running from the vertex along the posterior orbits to the chin; this *ocp.* is considered of great systematic value as it may be formed either by black, thin, pointed bristles or by whitish, thick, truncated bristles.

Vertex nearly always possessing three pairs of bristles, two of which near the lateral margins known as the *vertical bristles* (*vt.*), the inner pair being very long, the outer shorter and the third pair

behind the ocellar triangle known as the *post-vertical bristles* (*pvt.*) which may be parallel or diverging, never crossed, short and weak or very rarely wanting. The ocellar triangle usually bears a pair of bristles directed forwards, the *ocellar bristles* (*oc.*) which may be strong, well developed or weak.

Eyes rounded or narrow.



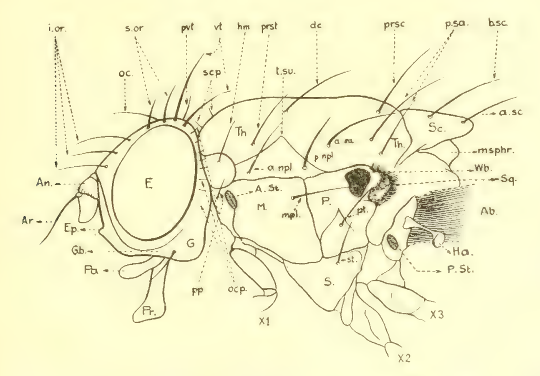
E : eye; Fr : frons; F. : face; An : antenna; Ar. : arista; Lu. : lunula; G. : gena or cheek; Pa. : palpus; Ep. : epistoma; Pr. : proboscis; Gn. : genal bristle; V. : vertex; oc. : ocellar bristle; vt. : vertical bristles; pvt. : post vertical bristle; s.or. : superior orbital bristles; i.or. : inferior orbital bristles; ocp. : occipital row of bristles.

Antennae drooping, important chiefly with regard the length of the third joint; they are not as a rule very elongated, rarely reaching the epistoma; the arista is usually bare, but sometimes it is pubescent or pilose on both sides or only on the upper side; in some Oriental forms, however, it may be plumose.

The proboscis may be short or more or less elongated and geniculate, i.e. with the flaps very much prolonged and directed backwards.

THORAX

With a characteristic chaetotaxy on the disc and pleurae, when it is said to be complete chaetotaxy ; in a few cases, however, some bristles are absent and the chaetotaxy is then reduced or incomplete. A complete chaetotaxy consists of 2 pairs of scapular, a pair of dorso-central, a pair of praescutellar, 1 humeral, 2 noto-



E. : eye; An. : antenna; Ar. : arista; Ep. : epistoma; G. : gena or cheek; Pa. : palpus; Pr. : proboscis; vt. : vertical bristles; pvt. : post-vertical bristle; s.or. : superior orbital bristles; i.or. : inferior orbital bristles; oc. : ocellar bristle; ocp. : occipital row of bristles; Gb. : genal bristle; Th. : thorax; M. : metapleura; P. : pteropleura; S. : sternopleura; Sc. : scutellum; msphr. : mesophragma; Wb. : wing base; Sq. : squamula; Ab. : abdomen; Ha. : halter; A.St. : anterior stigma; P.St. : posterior stigma; X1, X2, X3 : front, middle and hind legs; t.su. : transverse suture; scp. : scapular bristles; hm. : humeral bristle; dc. : dorso-central bristle; a.npl. : anterior notopleural bristle; p.npl. : posterior notopleural bristle; a.sa. : anterior supra-alar bristle; p.sa. : posterior supra-alar bristles; prsc. : prescutellar bristle; b.sc. : basal scutellar bristle; a.sc. : apical scutellar bristle; pp. : propleural bristle; mpl. : metapleural bristle; pt. : pteropleural bristle; st. : sternopleural bristle.

pleural, 1 praesutural, 3 supra-alar, 1 or 2 mesopleural, 1 pteropleural and 1 sternopleural.

Scapular (*scp.*) are two pairs of small bristles on the anterior margin of the thorax, sometimes indistinct but never obsolete; one pair is median or acrostichal and the other lateral or dorsocentral.

Dorsocentral (*dc.*) consists of usually one pair (very rarely 2 pairs) in the dorso-central region between the transverse suture and the scutellum, sometimes entirely absent.

Praescutellr (*prsc.*), 1 pair of bristles, on the hind margin, in front of the scutellum, rarely wanting.

Humeral (*hm.*), 1 bristle on the humeral callus, rarely wanting.

Notopleural (*npl.*), these consist of 2 pairs of bristles inserted above the dorso-pleural suture, in the notopleural depression; they are never absent; the one behind the humeral callus is called anterior and the one before the suture is called posterior; these *npl.* (*a.npl.* and *p.npl.*) are the post-humeral bristles of Osten-Sacken.

Praesutural (*prst.*), one before the suture and above the praesutural depression, sometimes wanting.

Supra-alar (*sa.*) these consist of 3 pairs; the pair behind the suture, the anterior (*a.sa.*), is very rarely absent, and the 2 other pairs, one above the root of the wing and the other on the postalar callus, the posterior (*p.sa.*), are always present; the *p.sa.* are also sometimes called postalar bristles.

Pteropleural (*pp.*), also known as the prothoracic, one bristle situated in front of the anterior or prothoracic stigma. It is not often present.

Mesopleural (*mpl.*), 1 or 2 bristles near the hind margin of the mesopleura, sometimes accompanied by some bristly hairs.

Pteropleural (*pt.*), 1 bristle on the pteropleura, beneath the root of the wing, usually strong, but sometimes weak.

Sternopleural (*st.*), 1 bristle near the hind margin of the sternopleura, very rarely wanting.

The scutellum is usually triangular in shape (but it may be semi-circular or even trilobate) its surface may be flattened or convex. It bears usually 2 pairs of bristles but sometimes only 1 pair.

Basal scutellar (*b.sc.*), 1 pair of bristles near the base, usually stronger than the apical pair, divergent, very rarely absent.

Apical scutellar (*a.sc.*) 1 pair of bristles near the apex usually weaker than the basal pair; they may be parallel, converging or even crossed, more often absent.

There is also rarely in the Oriental forms an intermediate pair of bristles between the basal and the apical.

The pubescence of the thorax may be more or less distinct, blackish or pale yellow and sometimes strongly developed; in addition the thorax usually bears a fine dust, pulverulence or tomentum.

ABDOMEN

With 4 segments in the male; it may be narrow or elongate, short and broad, or narrowed at the base; the first segment is very long and composed of 2 segments fused together and in rare cases all the abdominal segments are fused together (*Dacus longistylus*,

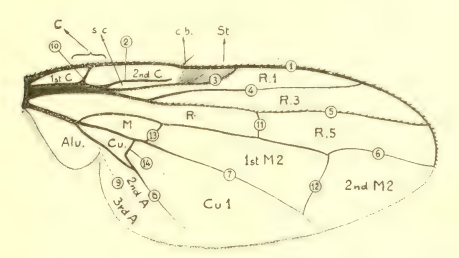
Wied.). Male hypopygium nearly always small and inconspicuous, usually globular. Female ovipositor corneous, composed of 3 joints and pointed, the basal joint being important in shape and length, it may either be flattened or cylindrical and either short, long or very elongated. The pubescence is usually similar to that of the thorax and the abdomen often bears some lateral and apical bristles.

LEGS

Usually short and robust, but sometimes long and slender ; front femora nearly always with a row of bristles below; middle tibiae with 1 spur in almost all the Egyptian and Palaearctic species, but in some of the Oriental species they may have 2 spurs; hind tibiae sometimes with a row of bristly hairs, but they may be pectinate or even pinnate in the exotic forms.

WINGS

Narrow or more or less broad, with a characteristic neuration and usually marked with a distinct pattern ; this pattern may be reticulate or may consist chiefly of bands, or bands as well as



1 : costa; 2 : sub-costa; 3 : Radius 1; 4 : Radius 2+3; 5 : Radius 4+5; 6 : Media 1; 7 : Media 3+Cubitus 1; 8 : Cubitus 2+Analis 2; 9 : trace of Analis 3; 10 : Humeral cross-vein; 11 : Radio-median cross-vein; 12 : Median cross-vein; 13 : Media 3; 14 : Cubitus 1+Cubitus 2; C : costal cell; 1st C. : 1st costal cell; 2nd C. : 2nd costal cell; s.c. : sub-costal cell; c.b. : costal bristle; St. : stigma; R.1 : Radius 1 cell; R.3 : Radius 3 cell; R.5 : Radius 5 cell; R : Radial cell; M : Media cell; Cu. : Cubitus cell; 1st M2 : 1st Media 2 cell; 2nd M2 : 2nd Media 2 cell; Cu 1 : Cubitus 1 cell; 2nd A, 3rd A : 2nd Analis and 3rd Analis cells; Alu. : Alula or axillary lobe.

spots; sometimes the wings are entirely hyaline. The subcostal vein becomes indistinct towards the end where it coalesces and is merged with the stigma. On the Costa, usually touching the inner margin

of the stigmal callosity, there is very often the *Costal bristle* which may be obsolete, more or less developed or even double. The shape and size of the stigma is important as it may be short, long or very long. R1 usually bears minute and short bristles, as may R4+5 but less often. The length, direction, form and position of the longitudinal and cross-veins and the form and length of the cells supply very important characters and should always be taken into consideration. The cells at the base of the wing are usually of large size and the Cu1 cell, which is also large, presents an excellent generic character in its inferior angle which is often drawn out into a point which, in some cases, is extremely long.

The longitudinal veins are :

The Costa (1) or Costal vein : ends at about R4+5 and is more or less thickened and ciliated over its whole length.

The Sub-costa (2), Auxiliary or Mediastinal vein : thin and often short and indistinct, but it may be quite distinct.

Radius 1 (3), 1st longitudinal or subcostal vein (R1) : variable in length; it may not reach the radio-median cross-vein, it may reach it or it may pass beyond it; it usually is bristly over its whole length.

Radius 2+3 (4), 2nd longitudinal or radial vein (R2+3) : is either straight, bent in the middle or wavy; more or less distant from R1 and very rarely bears a stump of vein.

Radius 4+5 (5), 3rd longitudinal or cubital vein (R4+5) : usually bare, but sometimes bristly over its whole length, at the base only or to the radio-median cross-vein; it may be straight or bent, parallel or diverging from M1, but very rarely converging towards it; it is also more or less approximate to R2+3.

Media 1 (6), 4th longitudinal or discoidal vein (M1) : this may be straight or curved after the median cross-vein, or it may be, very rarely curved forward at the tip.

Media 3+Cubitus 1 (7), 5th longitudinal or postical vein (M3+Cu1) : usually bare, but very rarely bristly over its whole length and more or less diverging from M1.

Cubitus 2+Analis 2 (8), analis, 6th longitudinal or anal vein (Cu2+2ndA.) : less important, more or less long, reaching or not reaching the hind margin.

Analis 3 (9) axillaris or Axillary vein (A3) : very indistinct.

The cross-veins are the following :

The Humeral (10) or basal cross-vein : not important; situated at the base and on the fore border between the costa and sub-costa.

The Radio-median (11) small, anterior or median cross-vein : very important and situated towards the middle of the wing, between R4+5 and M1; it may be long or short; placed before, on, or after the middle of 1st M2 cell; oblique or perpendicular.

The Median (12), hind or posterior cross-vein : very important and situated between M1 and M3 + Cu1, on the posterior part near the hind margin; it may be long or short, oblique or perpendicular, parallel or not with the radio-median cross-vein. The distance between it and the latter is very important, in relation to the position of the radio-median cross-vein; this distance, following Rondani, can be measured by the relative length of the various portions into which M1 is divided; these portions are : the first or basal, between the base and the radio-median cross-vein; the second or median, between the radio-median cross-vein and the median cross-vein; the third or apical, between the median cross-vein and the apex; or following Bezzi, (which in my opinion is the simplest and best method of the two) by reference to the length of the median cross-vein.

Media 3 (13), basal, anterior basal or discoidal cross-vein (*M3*): less important, situated in the middle of the wing near the base, between M1 and M3 + Cu1.

Cubitus 1 + cubitus 3 (14), anal or posterior basal cross-vein (Cu1 + Cu2) : between M3 + Cu1 and Cu2 + A2, near the base and below M3 cross-vein; this is very important; it may be convex or concave or with a very characteristic median bend (as in *Ceratitis*); the lower portion of this cross-vein is sometimes very prolonged (as in *Dacus*).

The cells are as follows :

Costal cell (C.) at the fore border and base, between the costa and subcostal vein; it is divided into two cells by the humeral cross-vein : the *1st costal* and *2nd costal cells;* the first is not important and not considered here, but the second may be short or long, broad or narrow.

Sub-Costal (s.c.) or mediastinal cell : not important, often very small and sometimes indistinct; it is situated below the costal cell, between the sub-costa and R1. The end of this cell however is dilated and forms a callosity known as the *Stigma* (st.) or pterostigma; this is important in its form, coloration and length as it may be short, long or often very much prolonged; at the base of the stigma where the sub-costal vein should end is situated the previously mentioned *costal bristle* (c.b.)

R1 cell (R1), marginal or sub-costal cell : between R1 and R2 + 3; may be narrow or broad.

R3 cell (R3), sub-marginal or cubital cell : below R1 cell and between R2 + 3 and R4 + 5; narrow or broad, more or less widened at the end.

Radial cell (R), or first basal cell : in the middle of the wing, between R4 + 5 and M1 veins and from the base to the radio-median cross-vein; more or less long and widened or not at the end.

R5 cell (R5) or first posterior cell : between the same veins, from the radio-median cross-vein to the outer margin of the wing; this cell may be widened at the end or may have parallel sides but very rarely narrowed at the end.

Media cell (M), or second basal cell : between M1 and M3 + Cu1. from the bifurcation of these veins to M3 cross-vein; more or less broad or widened at the end and sometimes very much dilated.

1st Media 2 cell (1st M2), discoidal or discal cell : between the same veins, from M3 to the median cross-veins; more or less long and more or less widened at the end, but very rarely narrowed at the end.

2nd Media 2 cell (2nd M2), or second posterior cell : in continuation of the preceding cell, between the same veins, from the median cross-vein to the outer margin of the wing; more or less widened.

Cubitus cell (Cu), anal or third basal cell : below M cell, between M3 + Cu1 and Cu2 + A2 from their bifurcation to Cu1 + Cu2 cross-vein; this cell is very important with regard to the shape of its inferior angle which is rarely obtuse, usually being drawn out into a point which is narrow or broad; it may be shorter than M cell or of equal length or longer and is sometimes much prolonged, reaching almost to the hind margin of the wing.

Cubitus 1 cell (Cu1) or second posterior cell : in continuation of the preceding, between M3 + Cu1 and Cu2 + A2 from Cu1 + Cu2 cross-vein to the lower margin of the wing; less important.

2nd Anal + 3rd Anal cells (2ndA + 3rdA) or third posterior + Axillary cells : between Cu2 + A2 and the lower margin, at the base; these two cells are partly fused with the axillary lobe and the preceding cell.

The pattern of the wings is very variable and is of great importance in the distinction of the species and even of the genera; however in this last case caution is necessary. In the palaearctic species the patterns may be classified in two distinct and principal types, the banded type and the reticulate type; the two types however may rarely be found in the same wing in exotic species, such as in *Acrotaenia* (Bezzi). The colouring of the wing is due to a tint in the wing-membrane itself, but if the wing of *Schistopterum* be examined microscopically it will be found due to peculiarly shaped and coloured hairs on the surface.

The ground colour of the wings may be considered as hyaline in the banded type, which is well developed in the so-called "rivulets" of many Trypaneids; the species which possess black wings with hyaline indentations and spots (*Spheniscomyia* etc.) are in reality an exaggeration of this type. There are other species which have almost entirely black wings but with the hyaline spots less

numerous, scattered and rather distant; these show a passage into the reticulate type. In this type the wings should be considered as black with numerous approximate hyaline spots, which break up the black colouring into a net-like or reticulate pattern. This network can be more or less closed owing to the form and size of these spots and sometimes quite broken up into brown isolated streaks. The so-called "star-shaped" pattern and the "radiating" pattern are special cases of this type.

The colouring of the pattern varies from yellow or brown to black; I fail to see any traces of red spots as stated by Becker in his original description of *Schistopterum*.

The adult flies are remarkable for their handsome aspect and coloration, chiefly due to the patterned wings which they usually hold spread out and trembling; they may frequently be seen running on leaves or feeding on flowers. They usually prefer shady and cool places, hence they are to be found on the under surface of broad leaves. The species of *Ceratitis* and *Dacus* seek the sweet exudations and secretions of plants or of certain insects such as the Coccidae (Scale-insects), but generally speaking the adults are to be found on those plants in which they oviposit and upon which their larvae feed.

The Trypaneidae live only and entirely on vegetable substances, some species being very serious pests. It is a remarkable fact that many of the species which may easily be obtained and observed in the larval stage, are rarely seen as adults, such as *Ceratitis capitata* Wied., *Carpomyia incompleta* Beck., etc. and these can only be easily obtained by breeding.

The female with their corneous and sometimes long ovipositors, place the eggs on those parts of the plants in and upon which the larvae are intended to live; the very variable length and form of the ovipositor denotes that the adaptations in this way are very numerous and different. The metamorphoses of many species, especially the harmful ones have been studied.

The habits of the larvae are very variable and these may be divided into four distinct groups according to the various parts of the plants which they attack.

1*st group.*

Larva feeding in fruits, usually preferring succulent fruits and are known as fruit-maggots; they attack different species of plants, digging into the pulp, going to the inner parts of the fruit and usually cause its fall; these belong chiefly to the *Dacinae* and most *Ceratitininae*.

2nd group.

Larvae living in the flower-heads of *Compositae;* they very rarely produce galls in the parts attacked; these belong to the *Trypaneininae* and *Urophorinae.*

3rd group.

Larvae living in the stems, flower-stems, leaves and buds, chiefly of *Compositae* and *Umbelliferae;* these belong to some of the *Ceratitinae.*

4th group.

Larvae living and producing galls in flowers, stems and roots; these belong to the *Trypaneininae.*

The eggs of the Trypaneidae in general are elongate, cylindrical and rounded at both ends; their shell is whitish, thin and smooth; and sometimes under high magnification it shows diverse sculpturing; at the anterior or cephalic end there is a central tuberculiform micropyle, which, when seen under the microscope appears as a prominent tubercle. Sometimes they may be crescent shaped. The dorsal surface is usually convex and the ventral surface almost flattened; their length is usually less than 0.9 mm. and breadth about 0.1 to 0.08 mm.

The larvae present very important characters for the object of discriminating the genera and species and should be, in future, much more keenly and carefully considered by systematists. They are whitish maggots, rounded and conical, more or less elongate and often ellipsoidal; they are pointed in front and abruptly truncated behind and are composed of from 12 to 14 segments (including the head), those of the cephalic end being very small and often very difficult to distinguish. In the last stage the larva is amphipneustic; the anterior spiracles are either on the second or third segment, small, crown-shaped and consist each of small papillae joined at the base; at the apex of each papilla there is an aperture. The posterior spiracles are placed on the last segment over the anus and nearer the dorsal than the ventral aspect; they are larger than the anterior spiracles, darker in colour, being yellowish or brownish and more or less prominent; each spiracle bears at the end a plate with three respiratory apertures which vary somewhat in shape. The body is often completely smooth but sometimes the ventral surface bears transverse rows of small spines. The anal end is usually somewhat impressed and often surrounded by a variable

number of tubercles some of which are provided with spinules. The head is usually trapezoidal in outline and provided on either side, anteriorly, with a short, two-jointed antennal organ; the form and length of the two joints are variable in the different genera and species. Immediately below the antennae and in front of the mouth hooklets the palpi are found; these are also variable in shape. The mouth parts are said to form the so-called 'pharyngeal skeleton' which may easily be seen and studied on account of the transparency of the teguments and its black colour. The most conspicuous structure is the two strong and thick mandibular hooks, which in the last stage form the 'pharyngeal skeleton'; these vary in shape and in curvature and they bear teeth or spurs, the positions and sizes of which are important. On each side of the hooks there is usually a convex structure furnished with raised transverse laminae and known as the oral lobes. The upper and lower pharyngeal plates constitute the internal portion. The labium is situated between and below the oral lobes, bearing sensoria and often difficult to distinguish.

The larvae of some species are provided with the faculty of jumping.

Larvae living in fruits (fruit-maggots) leave their host and pupate in the ground, while the pupation of those living in stems, leaves or flowers takes place in those parts.

The puparia are of the usual barrel-shaped form but they vary in colour and in the characters which the first stages of these flies present. I will here give very brief descriptions after the observations of Bezzi, Sylvestri and my own, to show the differences which are to be seen on superficial examination. *Dacus longistylus* Wied. has an elliptical, elongate, pale umber puparium with the segmentations not prominent, while that of *D. oleae* Gmel. is whitish, thin and almost opaque, also without prominent segmentations and with the posterior spiracles rather approximate and yellow. The puparium of *Ceratitis capitata* Wied. is elliptical, yellow to dark testaceous in colour, with dark yellow, approximate posterior spiracles and a small and smooth anal cicatrice; when examined from a dorsal or ventral side the anterior spiracles appear as two very short tubercles. *Carpomyia incompleta* Beck. has a pale yellow, hard, thick and opaque puparium; it possesses a well marked segmentation and transverse wrinkles on the surface; the posterior spiracles are rather distant and the anal cicatrice is small and smooth. *Urophora solstitialis*, according to Wadsworth, has a yellow to dark reddish-brown puparium with wrinkles on the surface; in shape it is cylindrical, obtuse or bluntly pointed at the anterior end, and obliquely truncate dorso-ventrally at the posterior end;

the segmentation is distinct and the pupa has a dull glistening appearance. *Myiopites blotti*, according to Bezzi has a thin, smooth, yellow puparium without a shining surface and with less distinct segmentation; the posterior spiracles are very small and rather distant. *Ensina sonchi*, according to the same author, has a very shining, thin, transparent, white puparium, with less distinct segmentation and rather distant, yellow posterior spiracles. The puparium of *Sphenella marginata* is extremely thin, shining and brownish black; it is very convex on the dorsal surface, where the segmentation is indistinct, and concave on the ventral surface, which is segmented and finely denticulate; the posterior spiracles are black and very approximated. Bezzi further states that according to Mik the species of the genus *Oxyna* have thin, smooth, flat-segmented, pale ferruginous puparia, and those of *Tephritis* thick, wrinkled, more strongly segmented puparia. The puparium of *Spheniscomyia* is pale ferruginous and that of *Euaresta iphionae* yellow to brownish-yellow. *Terellia planiscutellata* Beck. has a most remarkable puparium ; it is very broad, flat ventrally and very convex dorsally, punctate and with a very deep and conspicuous segmentation; while that of *Aciura tibialis* is smooth, very shining and of an almost metallic blue colouration.

A good many Hymenopterous parasites and predators of Trypaneidae are known and some of these have been used with success to cope with these pests. Among the parasites of the genus *Dacus* are known some Braconids of the genus *Opius*, such as *O. concolor*, *O. dacicida*, *O. lounsburyi* and *O. africanus orientalis* which are all parasites of *D. oleae*. *O. dexter* is a parasite of *D. longistylus*, *O. perproximus* and *O. humilis* of *Ceratitis capitata*. Members of *Hedylus*, *Diachasma* and *Biosteres* are parasitic on species of *Dacus* while *Sigalphus daci* and *Bracon celer* are both known to be parasitic on *Dacus oleae* as well as many Chalcidids of the genera *Eupelmus*, *Tetrastichus*, *Syntomosphyrum*, *Dinarmus*, *Eurytoma*, *Eulophus* and *Ormyrus*. Members of the genus *Ceratitis* are parasitised by Braconids of the genera *Opius*, *Hedylus*, *Diachasma* and *Biosteres;* by Proctotrypids of the genera *Galesus* and *Trichopria* and by Chalcidids of the genera *Dirhinus*, *Spalangia*, *Tetrasticus* and *Syntomosphyrum*.

Among the family Formicidae some species of the genera *Dorylus*, *Anomma* and *Acromyrma* are known to be predacious on pupae and larvae of *Dacus* and *Ceratitis*.

Classification

Up till 1870 the name Tephritidae was used for this family but owing to the fact that Meigen's name for the genus *Trypeta* (1803) is earlier than Latreille's *Tephritis* (1804) the family name Trypetidae has been used universally until recent times. Since then, however, it was discovered quite recently that *Trypeta* Meigen (1803) is the same as *Euribia* Meigen (1800), hence Czerny (1909) has proposed to call the family Euribiidae. Bezzi, however, has stated (1907) and later (1913) that the genus *Trypanea* (Trupanea) of Schrank (1795) must be employed in place of *Urellia* of Robineau-Desvoidy and Loew (1830) and that therefore the family name must be drawn from this genus and must be Trypaneidae.

The subdivision of the family Trypaneidae is very difficult and up to the present no one has been able to accomplish it in a satisfactory manner.

Bezzi's proposition to divide the family into two subfamilies the Dacinae and Trypaneinae, the latter into three tribes, the *Ceratitininae*, *Myiopitininae*, and *Trypaneininae* is in my opinion the best one and I have adopted it. These subfamilies and tribes are distinguished as follows:—

"1. *Subfamily Dacinae.* Antennae elongate, as long as or longer than the face, usually bare or very rarely shortly pilose. *Oc.* wanting; *pvt.* wanting or very small; *ocp.* wanting. *Hm.*, *prst.* and *dc.* wanting; anterior *sa.* and *prsc.* sometimes wanting; *pt.* usually weak; *st.* wanting. Abdomen of the female with the last segment (5th or 6th) hidden. Front femora without bristles below, or very rarely bristly. Scutellum with 2 or 4 bristles; if the bristles are only two it is always the basal (not the apical) pair that is absent. Wings with the auxiliary vein very approximate to the first longitudinal vein, and often very little distinct; the first three longitudinal veins are usually very approximated, the others are distant, the small cross-vein is therefore very long and oblique. Second basal cell usually very much dilated, and short at the base; anal cell narrowed, its inferior angle usually drawn out into a very long point, much longer

than the second basal cell. Pattern of the wings usually very simple and reduced to a fore border and some stripes; banded wings are very rare, and reticulated wings are never found.

The principal character of the subfamily is the reduced chaetotaxy of the head and the thorax. The species are tropical or subtropical and live almost exclusively in the old world. The larvae live only in fruits of various kinds and are never gall-makers."

"2. *Subfamily Trypaneinae.* Antennae usually shorter than the face, with a bare, pilose or plumose arista. *Oc.* mostly present, strong or small, as also the *pvt.; ocp.* more or less developed, but never wanting. *Hm.* always present but in a single case wanting; *prst.* rarely wanting; anterior *sa* present; *prsc* and usually one or rarely two pairs of *dc.* present; *st.* almost always present; *pt.* usually strong. Scutellum usually with two pairs of bristles but sometimes with three pairs; if only one pair is present it is always the basal (not the apical) pair, that is to say, the apical pair only can be wanting. Anterior femora usually bristly below (bare in *Euphranta*). Abdomen of the female with the last segment distinct and the others never fused together; the ovipositor usually flattened (cylindrical in some *Anastrepha*, *Carpophthoromyia* and *Urophora*). Auxiliary vein distinct; the first three longitudinal veins not approximated; second basal cell not dilated ; anal cell not narrowed, with the inferior angle drawn out into a point or not, shorter or longer than the second basal cell. Pattern of the wings varying from the banded to the reticulated type, rarely absent. The species are found in tropical, temperate and even cold countries; the larvae live in fruits, or in various parts of vegetables, and are very often gall-makers.

This great subfamily includes most of the proposed genera of Trypaneids. No attempts have been made to subdivide it and I think that Loew in his generic divisions has laid too much stress on the pattern of the wings, chiefly for practical purposes. Schiner has followed Loew with some little modification, and so have all subsequent writers. Rondani, in 1870, has given a more scientific arrangement, but he lays too much importance on the relative lengths of the various portions of the fourth longitudinal vein. I think that the subdivision of the subfamily Trypaneinae into other groups of subfamily rank is not at present possible; but I am of opinion that three secondary groups or tribes can be distinguished by the following characters:—

1st Tribe : Ceratitininae. Occipital row formed by thin black bristles, which at the most are yellow only in the post-vertical region; or the row is almost wanting, being only distinct in the superior portion. Arista often pilose or plumose. Thorax mostly clothed on

the back with black pubescence. Wings with the third longitudinal vein usually bristly over its whole length, or at least towards the base; anal cell usually with its lower angle drawn out into a point, and therefore as long as, or longer than, the second basal cell (obtuse in *Gonyglossum*). Wing-pattern of the banded type. The species of this tribe are most abundant in tropical or subtropical countries, but are not rare in temperate regions. The larvae often live in fruits, like those of the Dacinae; but some species mine into the leaves of umbelliferous plants or of Compositae; a few species are gall-makers, but none live in the flower heads of the Compositae.

2nd Tribe : Myiopitininae. This tribe has the same characters as the preceding, but the anal cell is always obtuse, its lower angle is never drawn out in a point; the ovipositor is long and cylindrical; the wings are banded. The species are found exclusively in temperate countries, being wanting in the tropics; the larvae live only on plants of the family Compositae, and often make galls.

3rd Tribe : Trypaneininae. Occipital row usually formed of strong yellow bristles, which are usually obtuse at the end. Thoracic pubescence yellowish. Wings with the third longitudinal veins usually bare; anal cell never longer than the second basal cell (obtuse in some forms). Wing-pattern usually of the reticulate type, rarely banded and sometimes hyaline. Ovipositor flattened. Arista usually bare. The species occur in temperate countries and also in cold regions; the larvae live usually in the flower-heads of the Compositae, and sometimes make galls, even on the roots of plants of this family.''

The family Trypaneidae is a very large one, over 1000 species being known from all over the world, and this number goes on increasing every year. The family has a wide distribution over all the globe, from the Arctic to the Tropical regions Over 300 species are known from the Palearctic region.

The known genera of Egyptian Trypaneids are arranged as fol lows according to Bezzi's classification.

SUBFAMILY DACINAE.

1. Dacus. including the subgenus Chaetodacus etc.

SUBFAMILY TRYPANEIDAE.

Tribe CERATITININAE.

2. Carpomyia
3. Myiopardalis
4. Ceratitis (*Petalophora*, *Halterophora*)
5. Sphenisocomyia
6. Metaspheniscus
7. Aciura

Tribe MYIOPITININAE.

8. Myiopites
9. Urophora

Tribe TRYPANEININAE.

10. Schistopterum
11. Terellia (*Trypeta, Euribia, Orellia, Cerajocera, Sitarea*)
12. Sphenella (*Sineura*, Lioy)
13. Ensina
14. Euaresta
15. Spathulina
16. Tephritis
17. Trypanea (*Urellia, Actinoptera, Trupanea*)

KEY TO THE EGYPTIAN GENERA OF TRYPANEIDAE

1 (2) *Prsc.* present .... CHAETODACUS Bez. (*Sub-genus*)

2 (1) *Prsc.* absent ....

3 (4) Chaetotaxy of head and thorax incomplete; no *ocp.*, *hm.*, *prst.* and *dc*...... 1 DACUS Fabr.

4 (3) Chaetotaxy complete, except for possible absence of *oc.*

5 (6) R2+3 with a stump .... 3 MYIOPARDALIS Bez.

6 (5) R2+3 without a stump ....

7 (8) Wings hyaline with incomplete yellow bands, *oc.* absent .... 2 CARPOMYIA A.Costa

8 (7) Wings not so; *oc.* present

9 (12) Wings hyaline with complete black bands as well as hyaline indentations at upper and lower margins

10 (11) Scutellum entirely shining black ..... 5 SPHENISCOMYIA Bez.

11 (10) Scutellum yellow at least at tip ...... 9 UROPHORA R.-D.

12 (9) Wings otherwise marked

13 (16) Wings black with hyaline indentations at upper and lower margins as well as spots

14 (15) Wings with only 1 hyaline isolated rounded spot in the black area; thorax mat-black; scutellum with 4 bristles .. 6 METASPHENICUS Hend.

15 (14) Wings with several isolated spots in the black area; thorax shining black; scutellum with 2 bristles .... 7 ACIURA R.-D.

16 (13) Wings otherwise marked

17 (22) Wings hyaline with dark complete and incomplete bands as well as spots

18 (19) Head much deeper than high and deeper than broad; proboscis long and geniculate; wings with 2 complete dark bands 8 MYOPITES Brébisson

19 (18) Head broader than high and much deeper than broad; proboscis short, not geniculate

20 (21) Wings very broad with incomplete yellow and brown bands as well as small irregular black spots; thorax and scutellum shining black with pale markings 4 CERATITIS MacLeay

21 (20) Wings much narrower with one complete dark band and spots on upper margin; thorax and scutellum uniformly dull yellowish-brown .... 12 SPHENELLA R.-D.

22 (17) Wings otherwise marked

23 (26) Wings black with the dark area covering almost the entire surface, but leaving the extreme base hyaline

24 (25) Thorax dull yellowish-brown; isolated hyaline spots in black area very numerous . . . .

25 (24) Thorax shining black; isolated hyaline spots in black area not more than three 7 ACIURA R.-D.

26 (23) Wings otherwise marked

27 (28) Wings entirely hyaline or if with transverse yellow bands then the *dc.* are 4 in number . . . . 11 TERELLIA R.-D.

28 (27) Wings not entirely hyaline; *dc.* normal · two.

29 (30) Wings rather broad, usually reticulate, the reticulation nearly always dark and conspicuous, and if not reticulate then the wings are blackish with hyaline indentations and spots ; head much broader than deep . . . . 16 TEPHRITIS Latr.

30 (29) Wings otherwise marked

31 (32) Wings narrow with a faint reticulation; head as deep as broad . . . . 13 ENSINA R.-D.

32 (31) Wings otherwise marked

33 (34) Wings with the dark area extending over two thirds of the surface and not radiating . . . . 15 EUARESTA Lw.

34 (33) Wings with the dark area extending over less than half the surface and from which radiate several narrow bands like the spokes of a wheel; rarely the radiation is obsolete and in this case some pale brown spots are present always in the upper half and apical two thirds of the wing only

35 (36) Dark area at base of wing . . . . 10 SCHISTOPTERUM Beck.

36 (35) Dark area at apical half (or more) of wing; wing base hyaline . . . . 17 TRYPANEA Schrank

KEY TO THE EGYPTIAN SPECIES OF TRYPANEIDAE

1 (22) (61) Wings with dark bands, the bands not broken up with hyaline spots.

2 (13) Thorax black or dark grey.

3 (10) Thorax at least partly shining black.

4 (5) Scutellum yellow at the tip .... **Uroph. macrura**, Lw.

5 (4) Scutellum shining black at the tip.

6 (9) Wings with 4 dark transverse bands.

7 (8) Base of wing black .... **Sphenisc. debskii**, Efflat.

8 (7) Base of wing hyaline .... **Sphenisc. aegyptiaca**, Efflat.

9 (6) Wings with one yellow transverse band and apex of fore margin yellow; base of wing with numerous small spots .... **Cerat. capitata**, Wied.

10 (3) Thorax dull mat-grey.

11 (12) Apex of wing broadly brown, with one hyaline oval spot between R2+3 and R4+5; scutellum dark .... **Metasph. gracilipes**, Lw.

12 (11) Tip of wing dark only at extreme apex, scutellum yellow .... **Uroph. quadrifasciata**, Meig.

13 (2) Thorax yellow or brown.

14 (19) Wings with bright brown or yellow bands.

15 (16) Thorax and scutellum unspotted ..... **Carp. incompleta**, Beck.

16 (15) Thorax and scutellum spotted.

17 (18) Thorax and scutellum with conspicuous shining black spots; only one pair of *dc* . . . . **Myiopar. pardalina,** Big.

18 (17) Thorax and scutellum with small black spots; 2 pairs of *dc.* present . . . . **Terel. jaceae,** R.-D.

19 (14) Wings with dark brown bands.

20 (21) Tip of wing with a small round dark spot only . . . . **Myop. varicfasciata,** Beck

21 (20) Wing tip broadly dark, the dark area extending below the apex of M1 . . . . . . **Sphenel. marginata,** Fall.

22 (1) (61) Wings with the dark areas broken up by hyaline spots.

23 (40) Wings without traces of bands, the dark areas broken up by numerous small hyaline spots, giving the wing a latticed appearance.

24 (35) Three hyaline spots on Costa, between ends of R1 and R2+3

25 (28) Reticulation faint.

26 (27) Reticulation very faint, but hyaline spots very numerous; thorax with 3 distinct lines; proboscis not geniculate . . . **Teph. lauta,** Lw.

27 (26) Reticulation less faint and spots larger; thorax without conspicuous lines; proboscis geniculate . . . . **Ensina sororcula,** Wied.

28 (25) Reticulation conspicuous.

29 (30) Wings with only 2 hyaline spots after radio-median cross-vein in R5 cell **Spath. parceguttata,** Beck.

30 (29) Wings with more than 2 hyaline spots after radio-median cross-vein in R5 cell.

31 (32) Proboscis geniculate, the recurrent part as long as the basal .... **Teph. conyzae**, FRFLD.

32 (31) Proboscis geniculate, but the recurrent part much shorter than the basal.

33 (34) Wings with only six hyaline spots in R5 cell, the 5 apical ones almost of equal size .... **Teph. argyrocephala**, LW.

34 (33) Wings with more than 6 hyaline spots in R5 cell, of unequal size .... **Teph. praecox**, LW.

35 (24) Only 2 hyaline spots on Costa between ends of R1 and R2+3.

36 (39) Base of 1st M2 cell hyaline.

37 (38) Apex of 1st M2 dark, with one large hyaline spot close to median cross-vein **Teph. spreta**, LW.

38 (37) Apex of 1st M2 cell dark, with 2 or 3 small spots close to median cross-vein. **Teph. matricariae**, LW.

39 (36) Base of 1st M2 cell dark .... **Teph. tessellata**, LW.

40 (23) Wings otherwise marked.

41 (48) Wings with a dark area from which radiate several narrow dark bands like spokes of wheel.

42 (43) Dark area at base of wing .... **Schist. moebiusi**, BECK.

43 (42) Base of wing hyaline.

44 (45) Five dark radiating narrow bands reaching wing tip .... **Trypan. augur**, FRFLD.

45 (44) Less than 5 dark radiating narrow bands reaching wing tip.

46 (47) Three dark radiating narrow bands reaching posterior apical part of wing (termen). .... **Trypan. amoena**, FRFLD.

47 (46) Only 2 dark radiating narrow bands reaching posterior apical part of wing (termen). . . . . **Trypan, stellata,** FUESSLY

48 (41) Wings otherwise marked.

49 (50) Pale species; wings with faint markings only . . . . **Trypan. eluta,** MEIG.

50 (49) Wings with dark markings conspicuous.

51 (56) Extreme apex of wing hyaline.

52 (53) Hyaline spot on Costa small, not reaching below R2+3 . . . . **Euar. iphionae,** EFFLAT.

53 (52) Hyaline spot on Costa extending below R2+3

54 (55) Wings with hyaline indentations at fore and hind borders but without hyaline spots in the dark area . . . . **Teph. desertorum,** nov. spec.

55 (54) Wings with hyaline indentations at fore and hind borders as well as isolated hyaline spots in the dark area . . . . **Teph. pulcherrima,** nov. sp.

56 (51) Extreme apex of wing dark.

57 (58) Wings largely pale, only one complete dark band which is broken up by hyaline spots; wing tip dark with 2 or 3 small hyaline spots . . . . **Sphenel. marginata,** FALL.

58 (57) Wings mostly dark.

59 (60) Wings with the dark area only containing a single round hyaline spot; thorax mat-grey . . . . **Metasph. gracilipes,** LW.

60 (59) Wings with 3 hyaline spots in the centre of the dark area; thorax shining black . . . . **Aciura tibialis,** R.-D.

61 (22) (I) Wings entirely hyaline or with only a dark spot or shading at apex of wing.

62 (71) Cu2 bent at right angles, the inferior angle of Cu cell drawn out to a point extending well beyond M3; wings with a spot or cloud at apex.

63 (64) *Prsc.* present .... **Chaetod. zonatus,** SAUND

64 (63) *Prsc.* absent.

65 (66) Wings with a very dark stigma and Sc. and Costa darkened; thorax dark with very conspicuously contrasted yellow humeri and scutellum .... **Dac. annulatus,** BECK.

66 (65) Stigma not very dark; thorax paler.

67 (68) Thorax with 3 dark longitudinal lines; medium sized species (6 mm.) .... **Dac. oleae,** GMEL.

68 (67) Thorax without stripes.

69 (70) Large species (9 mm.); humeri, prealar calli and scutellum pale yellow .... **Dac. longistylus,** WIED.

70 (69) Small species (4.3 mm.); prealar calli and scutellum reddish brown, almost unicolorous with thorax .... **Dac. semisphaereus,** BECK.

71 (62) Cu2 at most bent at an obtuse angle; inferior angle of Cu cell not elongated; wings entirely hyaline.

72 (73) Thoracic pubescence bright yellowish-brown; large species (6.3 mm.) wings tinged yellowish at base .... **Terel. virens,** LW.

73 (72) Thoracic pubescence very pale greyish or yellowish ; wings not yellowish at base; smaller species (from 4.8 to 3.5 mm.).

74 (75) Wings milky white ; thoracic pubescence very pale and abundant; upper

s.or. white; small (3.5 mm.) very pale species .... **Terel. planiscutellata**, BECK.

75 (74) Wings clear; thorax blackish and the pale pubescence less conspicuous; upper *s.or.* black; larger (4.8 mm.) and darker species .... **Terel. serratulae**, L.

1. DACUS Fabricius.

F., Syst. Antl., 215. (1805); Meig., Syst. Beschr., VI.22.1. (1830).

Easily distinguished from all the other genera by its weak and incomplete chaetotaxy, the long stigma and by the inferior angle of Cu cell, which is extremely elongated and pointed.

Head broader than high; frons fairly broad; face somewhat swollen in the middle, but flattened and with well developed antennal furrows reaching the epistoma; eyes rather small and fairly prominent; occiput usually without any lateral swellings; cheeks usually narrow; proboscis very short, not geniculate; palpi small; antennae inserted at, or immediately below the middle of the eyes, narrow and very elongated on account of the third joint, which is about two and a half times the length of the second; arista bare; cephalic chaetotaxy incomplete and weak; *oc.* and *pvt.* absent; *vt.* not strong; *s.or.* 1, *i.or.*2, all weak; *ocp.* absent; genal bristle almost obsolete.

Thorax characterised by its very weak chaetotaxy; the humeral callus is always very prominent, conspicuous and lighter in colour; usually the praealar callus (bearing the posterior *npl.*) is also prominent and paler in colour; *scp.*1 or 2; *dc.*, *prsc.* and *st.* absent; *npl.*2; *a.sa.* absent; *p.sa.*2; *mpl.*1; *pt.* more or less strong; scutellum with a pair of *a.sc.* only. Abdomen usually fairly elongated, distinctly narrowed at the base, convex and entirely devoid of bristles or bristly hairs; the five abdominal segments are often fixed and fused together; male hypopygium small; female ovipositor shows considerable variation in length in different species; it is usually cylindrical, but it may be quite short and cylindrical or flat; or it may be as long or even longer than the abdomen, in which case it is cylindrical and its length is due to the basal joint; legs normal; middle tibiae with a single spur. Wings normal in shape without any conspicuous bands or spots, and characterised by the inferior angle of Cu cell which is extremely elongated, sometimes reaching almost to the hind margin of the wing; stigma narrow and very elongated; costal bristle absent; costal vein thickened; *Sc.* indistinct; R1 bristly, ending before, at, or after the radio-median cross-vein; R2+3 not straight, near R1; R4+5 bristly over its whole length, usually much bent and diverging from M1; M1 curved after the median cross-vein; M3+Cu1 much diverging from M1; Cu2+2ndA long, reaching the hind margin; radio-median cross-vein always placed after the middle

of 1st M2 cell; median cross-vein long and oblique, not parallel with the radio-median cross-vein; Cu1+Cu2 with a very characteristic, deep, median bend, and with its lower portion considerably prolonged; M cell much dilated; Cu cell with the inferior angle drawn out into a point, in some cases reaching almost to the hind margin of the wing.

TYPE : *Musca oleae* GMELIN (1788)

This genus has become a very large and important one in late years, owing to which fact Bezzi and Hendel have been compelled to split it up into many subgenera and divisions This applies particularly to the Aethiopian, Oriental aud Australian members of the genus, which are very numerous and differentiated. As the Palaearctic species however are only five in number (including the doubtful *sexmaculatus*, Walk.) I propose to leave them in the old genus, as no useful purpose would be served in splitting them up into various subgenera, their individual characters being sufficiently distinctive. In the case of *zonatus*, Saund. however, I have preferred to place it in the subgenus *Chaetodacus.*

The five species of the genus *Dacus* represented in the Palaearctic Region have all been recorded in Egypt but *D. oleae*, Gmel., the well known fruit-fly of the olives is most certainly not established in the country. Of the other four species *D. longistylus*, Wied. is the only one that can be considered as an Egyptian species. *D. semisphaereus*, Beck. and *D. annulatus*, Beck. have never been recorded from this country since they were originally captured by Ehrenberg in 1857. I am of opinion, therefore, that unless these two species are recaptured in Egypt, they should not be considered as "Egyptian." Practically the same applies to *D. sexmaculatus*, Walk., but the arguments for the suppression of this species from the Egyptian fauna are even stronger, as the type has very probably been destroyed and moreover most of the species of this author have become synonyms

TABLE OF EGYPTIAN SPECIES (Sensu lato)

1 (10) *Prsc.* absent	DACUS (s. str.)
2 (5) Occiput with distinct lateral swellings	
3 (9) Ovipositor cylindrical	
4 (6) First segment of ovipositor at least as long as the whole abdomen	**1 longistylus,** WIED.
5 (2) Occiput without any lateral swellings	
6 (4) First segment of ovipositor shorter than the apical segment of the abdomen	
7 (8) Thorax and abdomen almost entirely dark rusty brown	**2 annulatus,** BECK.
8 (7) Species entirely yellow or reddish-yellow	**3 semisphaereus,** BECK.
9 (3) Ovipositor flattened; wings in the male without any deep sinuosity on the hind border at the end of Cu2+2nd A; species dark	**4 oleae,** GMEL.
10 (1) *Prsc.* present	**Chaetodacus** (*Sub-genus*)
Wings in the male with a remarkable deep sinuosity on the hind border at the end of Cu2+2nd A; species yellow	**zonatus,** SAUND.

DACUS LONGISTYLUS Wiedemann
(Pl. I figs. 6 and 9, Pl. II fig. 3)

Wied. Aussereurop. Zweifl. Ins., II. 522. 14. (1830).
Kingi, Frogatt Proc. Linn. Soc. N.S. Wales, XXXV, 866. (1910).

DIAGNOSIS:— A light reddish-brown, comparatively large species, distinguished by its very long and cylindrical ovipositor and by the lateral swellings of the occiput.

Male and *Female*. Length of body : 7—9 mm.; ovipositor : 3.5 mm.; wing : 5.9-6.2 mm.

DESCRIPTION:— Frons yellow to reddish-yellow, except for two small elongated blackish spots from which arise the *s.or.;* sometimes the frons is dark brown below, at the base of the antennae; face light waxy yellow, very shining and with the two characteristic rounded or oval black spots, one in each of the antennal furrows; cheeks medium in breadth and of the same pale colour as the face, which colour continues upwards along the margin of the occiput; epistoma usually blackish except for a small space in the centre, in front yellow; proboscis reddish-brown and possessing some erect pale yellow hairs; ocellar triangle blackish; antennae brownish-yellow with the elongated third joint not pointed at the tip and usually darker in colour, being dark reddish-brown; the second and third joints bear a very minute shining white tomentum and in addition the second joint possesses some very fine white hairs; arista dark reddish-brown except on its basal third yellow to pale yellow; all the bristles are blackish.

Thorax of a characteristic dark reddish-brown colour with bright straw-coloured spots and entirely covered with a delicate silvery white tomentum and a fine white pubescence which gives it a brownish-grey appearance; there are also three more or less indistinct longitudinal dark lines in the upper third of the disc; the straw-coloured spots on the disc are disposed as follows : two large oval spots covering the humeri, two elongated somewhat triangular spots immediately before the suture, and in the lower half, an isolated triangular spot in the centre; the pleurae also possess conspicuous straw-coloured spots as follows : one large spot covering all the posterior half of the mesopleurae and which is in reality a continuation of the elongated spot immediately before the suture, one small rounded spot on the upper end of the sternopleurae and one large spot on the metapleurae; all the bristles are black; scutellum entirely pale yellow with 2 *a.sc.*

Abdomen reddish-yellow to dark reddish-yellow, with the lower

half of the second and the apical third of the third segments pale yellow; often also the lower margins of the fourth and fifth segments are paler but this is chiefly due to a minute white pulverulence present on the lower halves of the four apical segments and which gives the abdomen a characteristic grey banded appearance in certain lights; pubescence uniformly fine and shining white; female ovipositor cylindrical, reddish-yellow, shining and with the basal segment at least as long as the whole of the abdomen.

Legs yellow to pale yellow but with the apices of the femora darker, especially the hind femora; middle tibiae with one large and a second much smaller spur.

Wings hyaline with all the veins yellow and with a characteristic brown spot at the apex of the undulated R4+5; the stigma, subcosta and cells R1 and R3 are yellow; there is also a very diffuse, indistinct brownish spot in 1st M2 cell, below the radio-median crossvein.

D. longistylus, var. nov. *clarus* (Pl. II fig. 2)

This variety is distinguished by the entirely yellow frons and antennae and by the general colour which is lighter, especially on the disc of the thorax where the ground colour is paler, hence the insect has a yellow appearance.

D. longistylus is found in Upper Egypt only, where it is very common wherever its food plant *Calotropis procera* grows. The larvae live in the fruits feeding on the seeds — and the adults run about on the leaves and fruits in the sunshine. I have captured it in Asswan and Kom-Ombo on *C. procera* only and have also bred it from larvae living in the fruits of that plant from the same localities, in January 1923.

The var. *clarus* however is so far known from Kharga Oasis only. I have before me 12 specimens of *D. longistylus* originating from the above locality, belonging to the collection of the Ministry of Agriculture and captured by Dr. L. H. Gough on 12.9.1917. 5 of these (2 ♂ and 3 ♀) are var. *Clarus* and the other 7 typical *D. longistylus*.

DACUS ANNULATUS Becker
(Pl. II fig. 5)

Beck., Mitteil. Zool. Mus. Berlin, II. 138. 224 (1903).

DIAGNOSIS:— A small dark rusty brown almost black species with pale yellow legs and a short cylindrical ovipositor.

Male and Female. Length of body : 6—6 8 mm.; ovipositor : 0.6 mm.; wing : 5.5 mm. —

DESCRIPTION:— Frons reddish-brown except for three spots from which arise the fronto-orbital bristles and the extreme base of the antennae brownish-black; face pale yellow with the usual two small blackish spots situated in the upper half and on the inner sides of the antennal furrows; proboscis and palpi yellow; cheeks narrow, pale yellow; vertex shining reddish-brown with the vertical triangle blackish; occiput shining black; antennae reddish-brown but the basal segment and the apical half of the third segment usually darker.

Thorax dark rusty-brown, dull, almost black except the humeri and two elongated triangular spots immediately before the suture yellow; these two spots continue below on the mesopleurae and end by a small spot on the sternopleurae; the metapleurae are also yellow; the whole of the disc and pleurae are covered with a very delicate, short and white pubescence; all the bristles are black; scutellum yellow with two black *a.sc.*

Abdomen dark rusty brown in the female but much darker in the male; the apical half of the second segment, however, is much paler and is at most dark yellow; male hypopygium reddish-brown; ovipositor very small, cylindrical and reddish-brown; the pubescence of the abdomen is uniformly short and white and shows a curious median line as if it had been parted in the centre.

Legs yellow except the bases of the middle and hind tibiae and the apices of the femora dark brown; sometimes the hind tibiae are entirely dark brown; middle tibiae with a single spur.

Wings hyaline with the veins yellowish-brown and a thin brownish line running along the base of R2+3 and R4+5; consequently the stigma and the whole of the *sc.* cell are brown, as well as the outer margin of R1 cell.

D. annulatus, in my opinion, is not a Palaearctic species. I have before me one ♀ (one of Dr. Beckers types) belonging to the Berlin Museum which was supposed to have been captured in Egypt by Ehrenberg in 1856. I also possess 6 specimens (5 ♂ and 1 ♀) from Erythrea, given to me by my friend Prof. Dr. A. Mochi and I am told that this species is very common in Massawa.

DACUS SEMISPHAEREUS, Becker

(Pl. III fig. 1)

Beck., Mitteil. Zool. Mus. Berlin, II.139.225.(1903).

DIAGNOSIS:— A small, somewhat globular, entirely reddish-yellow species with a very short cylindrical ovipositor.

Female : length of body : 4.3 mm.; ovipositor : 0.3 mm.; wing : 3 mm.
Male : Unknown.

DESCRIPTION:— Frons dull reddish-yellow; face pale yellow, shining and possessing the two usual dark rounded spots in the antennal grooves just above the epistoma; cheeks yellow; occiput and vertex reddish-yellow, with the ocellar triangle brownish; palpi and antennae somewhat dull reddish-yellow, but the latter with the extreme tip of the third joint dark brown; all the bristles are blackish.

Thorax entirely reddish-yellow except the humeral and prealar calli pale yellow, as well as the posterior half of the mesopleurae and a small spot on the upper margin of the sternopleurae; the pubescence is very short, white and rather dense; all the bristles are black; scutellum yellow, somewhat shining, with two black *a.sc.*

Abdomen of a characteristic shape resembling somewhat a hollow hemisphere, especially when seen sideways; it is of the same reddish-yellow colour as the thorax but on the three basal segments there are some irregular blackish spots; the pubescence is uniformly short and white; ovipositor very short, cylindrical and reddish-yellow.

Legs entirely reddish-yellow; middle tibiae with a single spur.

Wings hyaline with the usual brown spot at the apex, not isolated but joined narrowly with the brown stigma by a thin brown line running along the upper margin; the Cu cell is entirely brownish and the radio-median cross-vein is blackish owing to its being finely bordered with brown.

I have before me Dr. Becker's type, being the only specimen known so far of this curious species. It belongs to the Berlin Museum and like the preceding has been captured by Ehrenberg and bears the vague label 'Egypt.'

DACUS OLEAE, Gmelin
(Pl. II fig. 4)

Gmel., Syst. Naturae, 1.5.2844 (*Musca*) (1788); Sieuve, (1769); Penchienati, 595. (1788); Rossi, 317.1538 (*Musca*) (1790); Giovene, (1792); Olivier, 386.(1792); Fabr., 349.152. (*Musca*) (1794) et 215.3. (*Oscinis*) (1805); Coquebert, 110.pl.XXXIV.f.16. (*Musca*) (1804); Bayle-Barelle, 101. (*Musca*) (1809); Pollini, (1817); Briganti, 97.pl. (1822); Tripaldi, 139. (1822); Meig., 264.6. (*Brachyopa*) (1822) et 22.1.pl. VI.L.f.11—13. (1830); Risso, 230.(1827); A. Costa, 202. (1828); Grimaldi, 1. (1828); Passerini, 10. pl. (*Musca*) (1829); Wied., 515 nota. (1830); Laure, 17. (1834); Gene,

184.131. (*Oscinis*) (1835) et (1847); MACQ., 451.1(1835) et 370.(1852); BOYER DE FONSCOLOMBE, 112. (1840); CAUVIN (1840); NOTARIANI, (1841); ROMANO, pl. (1843); MAZZAROSA, 515.(1847); ROUBANDI, (1847); BOMPAR, (1848); MUSSO, (1848); BLAUD, (1849); MINA PALUMBO, 241. (*Oscinis*) (1852); LATR., IV.351. (1796); GUERIN-MENEVILLE, XIX. (1845); LUCAS, III. 496.252 (1849) et 13. (1881); O. COSTA, (1857) et 91.pl.V.A. (1877); COMPANYO, Pl. (1858); LW., 124.1.Pl.XXXI. f.2. (1862); HAGEN, 502. (1863); SCHIN., II.175. (1864); DISCOUZI, 227.24.(1862); BOISD., 604 (1867); ROND., VII. Dacoidi.48.1. (1871); KALTENB., 437.6.(1872); PERAGALLO, (1882) ALFONSO et BONAFEDE, 13.(1882) ; VITALE, (1887) ; MASSALONGO, 323,47.(1891) BRAUER, 88.(1883); del GUERCIO, (1900); LEONARDI, 272.f. 146.147(1900) RIBAGA, 27.f.15-18.(1901); BERLESE, 2-23.f.1-10.(1907); SILVESTRI (1907) et VIII.(1913) et (1914); PAOLI, 27. (1908); SACK., 7.4.(1908); BEZ., 290.(1909).

var. *funestus* et var. *flaviventris* del GUERCIO, (1900); BERLESE, (1907).

DIAGNOSIS:— A small reddish-brown species with reddish-yellow legs and a short, flattened ovipositor.

Male and Female. Length of body : 6 mm.; ovipositor : 0.6 mm.; wing : 4.5 mm.

DESCRIPTION:-- Frons reddish-yellow except along the margins of the eyes narrowly yellow; face shining yellow with the two blackish spots rather large, rounded and situated in the lower halves of the antennal furrows; cheeks narrow and reddish-yellow like the occiput; proboscis yellowish-brown, palpi reddish-yellow; antennae reddish-brown with the tip of the third joint usually blackish; all the bristles are black.

Thorax reddish-brown with three darker shining longitudinal lines on the disc and with a few other irregular blackish markings; the humeral and pre-alar calli are usually pale yellow and this colour is more extensive on the mesopleurae, leaving only the anterior lower angle and anterior margin reddish-yellow; the metapleurae are pale yellow and the usual pale spot on the upper margins of the sternopleurae is also present; the disc and most of the pleurae are covered with a very delicate white pulverulence which gives it a very dull appearance except on the three darker longitudinal lines; pubescence uniformly short and white; all the bristles are black; scutellum yellow with two black *a.sc.*

Abdomen reddish-brown with some irregular blackish spots on the second and third segments, those on the second segment being more constant and usually two, one on each side of and near the upper margin, but not touching the latter; the whole abdomen is somewhat

shining except on the apical half of the second segment owing to a fine white tomentum; the pubescence is short and white like that of the thorax; ovipositor, conical, flattened and shining black except at the base reddish-brown.

Legs entirely reddish-yellow.

Wings hyaline except the stigma yellowish-brown and a small isolated brown spot on the tip of R4+5.

The only three specimens known from Egypt of this species are : one in the collection of the Ministry of Agriculture labelled "Coll. Willcocks. 11.1912. Egypt ? " and two in the Sultanic Agricultural Society Collection, both labelled "from ? dates stored — Gizeh, Nov. 1912." This last data must be an error, for Mr. Willcocks * states that his specimens were bred from pupae found in a piece of wrapping paper which he was given one day in November 1912 at Gizeh by Mr. T. Brown to wrap up some specimens he had collected. What the specimens were he does not remember but he declares that they were not specimens which could harbour the olive fruit fly. He further states that the pupae were not observed until the parcel was opened in the laboratory and then they were found attached to the paper where it had been folded. The paper in question had been taken out of a room in which various fruits had been stored but Mr. Willcocks was unable to ascertain if Egyptian olives had been kept there.

Dacus oleae Gmel. is spread through the whole of the Mediterranean basin, through the whole of Northern, Eastern and Southern Africa, Canary Islands and in Western Asia. It probably also occurs in India and wherever the species of the genus *Olea* exist.

DACUS SEXMACULATUS Walker

Walk., The Entomologist, V. 344.83. Ortalid. (1871).

"Male. Reddish, slender, testaceous beneath. Head testaceous, with a black dot on each side of the facialia. Eyes piceous. Palpi long, slender. Antennae reaching the epistoma. Thorax with a black spot on each side near the scutellum, which is testaceous. Abdomen with a black spot on each side of the second segment. Legs testaceous. Wings pellucid, with a black costal stripe, which is slightly dilated at the tip; veins black, testaceous at the base; discal transverse vein nearly straight, parted by one fourth of its length from the border and by much more than twice its length from the praebrachial transverse vein. Length of body 3 lines. Harkeko."

(*) A Survey of the more important Economic Insects and Mites of Egypt, p. 226, 1922.

The above is the original description by Walker of this doubtful species.

I have not seen the type and am not aware that it exists; moreover I have seen no specimen to which this description applies.

CHAETODACUS (*Dacus*) ZONATUS, SAUNDERS
(Pl. II fig. 7 and Pl. I fig. 22)

SAUND., Trans. Entom. Soc. Lond., III. 61 Pl. 5. f. 3 (*Dasyneura*) (1841); WALK., List Dipt. Brit. Mus., IV. 1075. (*Dasyneura*) (1849); BEZ., Boll. Labor Zool. Portici, III. 293 et 299 (*Dacus*) (1909) et Mem. Indian Mus., III.3.94. Pl. VIII. f.4. (*Bactrocera*) (1913), ENDERL., Zool. Yahrb., XXXI. 408. (*Dacus*) (1911).

maculigera, DOLESCHALL, Nat. Tijdschr. v. Ned. Indie, XVII. 122.79. (*Bactrocera*) (1859); FROGATT, Report on par. and inj. Ins., 1907-08.94. (*Dacus*) (1909); BEZ., Boll. Labor. Zool. Portici, III. 294 et 300 (*Dacus*) (1909).

persicae, BIGOT. Ind. Mus. Notes, 1.192 (*Rivellia*) (1889); COTES, l.c.195. (*Rivellia*) (1889); LEFROY, Ind. Ins. Pests 170. f. 193 (*Rivellia*) (1906); BEZ., Boll. Labor. Zool. Portici, III. 293 et 298. (*Dacus*) (1909); FROGATT, Report on par. and inj. Ins., 1907-08.82.Pl.II f.5. (*Dacus*) (1909).

DIAGNOSIS:— A medium size yellow species, easily distinguished by the presence of the *prsc.* and by the rather large and broad wings.

Male and Female. Length of body : 6.5—7 mm.; ovipositor : 0.7 mm.; wing : 5.7 mm.

DESCRIPTION:— Frons and face reddish-yellow to yellow, the latter with the two blackish oval spots in the lower half of the antennal furrows; cheeks, occiput, proboscis and palpi reddish-yellow; vertical triangle blackish; antennae reddish-yellow with the apex of the third joint dark brown; all the bristles are reddish-brown.

Thorax reddish-yellow with irregular longitudinal darker lines on the disc and a thin yellow line close to the outer margin below the suture; the humeral and prealar calli are pale yellow as well as more than half of the mesopleurae, the whole of the hypopleurae and a spot on the upper margin of the sternopleurae; the whole of the thorax is covered with a very delicate white pulverulence, except in the position of the darker lines; the pubescence is short and white all over; all the bristles are dark reddish-brown and the presence of the *prsc.* at once distinguishes this species; scutellum shining yellow with two

reddish-brown *a.sc.* and a pubescence similar to that of the thorax.

Abdomen reddish-yellow, with usually the upper margin of the third segment blackish and the lower half or more of the second segment appearing pale greyish owing to a very delicate white pulverulence; the pubescence is uniformly short and pale; ovipositor longer than the fifth segment, conical, flattened and reddish-yellow. There is a row of bristles on each side arising from the lower margin of the third segment.

Legs entirely reddish-yellow or yellow except the base and apex of the hind tibiae brownish.

Wings large and broad, hyaline, with one small brownish spot at the apex of R4+5 (which is not always very distinct) and a large grey spot covering the apex of Cu2+2nd A; the stigma is dark; this species shows a small but remarkable difference in the sexual wing-domorphism which consists of a deep sinuosity at the end of Cu2+2nd A on the hind border in the male only; this causes the 3rd A. cell to be produced like a second axillary lobe.

This species, so far is not indigenous to Egypt, but it is not unlikely that it may be introduced into our country. I have before me 2 specimens from the collection of the Ministry of Agriculture labelled "Port-Said, Customs from India, Sample N° 1036.14.V. 1914."

Ch. zonatus is very common and widely distributed in India where it is a serious pest on peaches; it is also known from Amboina and Sumatra.

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2. CARPOMYIA A. Costa.

A. Costa, Annal, scient., i, 87, (1854); Rond., Bull. soc. entom. ital. i, 164, (1869); Bez., Boll. Labor. Zool. Portici, V, (1910).

Distinguished from the preceding genus, to which it is very similar by the pattern of the body and wings, by the absence of the *oc.*, and the shape of the head.

Head about as broad as high; frons slightly prominent; face flat and the fairly broad cheeks are narrower than in the preceding; eyes a little narrowed; epistoma not prominent; proboscis short, not geniculate; palpi small and bristly; antennae inserted at, or immediately below, the middle of the eyes, elongated; the third joint at least twice the length of the second, not attenuated and pointed at the upper corner; arista microscopically pubescent; *s.or.*2, *i.or.*3; *oc.* obsolete; *prt.* not long, parallel; *ocp.* feebly developed. Thoracic chaetotaxy complete. Abdomen rather broad convex and bristly on the lower margins and the tip. Male genitalia and female ovipositor similar as in *Myiopardalis.*

Wings narrow, with a pattern similar to that of the preceding genus, but the yellow cross-bands are sometimes much reduced; costal bristle distinct or double; R2+3, R4+5 and M1 straight; R4+5 bare and parallel with M1 at the tip; radio-median cross-vein placed towards the middle of 1st M2 cell.

TYPE : *Carpomyia vesuviana* A. Costa (1854)

There has been great confusion over this genus. Bezzi has clearly shown in his paper of 1910 that it was named in MS. by Rondani in 1870, while the original mention of the genus appeared in Prof. A. Costa's rare paper "Framenti di entomologia napoletana, Naples 1854." Rondani, however, made matters worse by changing his opinion no less than three times, proposing successively as type three different and quite distant species. Hence the confusion, increased later by Walker and by Schnier through the wrong interpretation of the genus *Orellia*, became greater and persisted until our time.

Up to the present only two species have been described, both from the Palaearctic Region and inhabiting different species of *Zizyphus*, and as early as 1854 A. Costa stated that he obtained his

species (*vesuviana*) from the fruits of *Zizyphus sativa.* The pupae of this and the second species are pale in colour, and according to Bezzi are similar in all respects to that of *Rhagoletis cerasi* Linn., which has been carefully and accurately studied by Prof. Mik, (Wien. Entom. Zeitg., 279. X. taf. IV, (1898).

C. incompleta Beck is the only species of the two known from Egypt and its larva inhabits the fruits of *Zizyphus spina-christi* and Z. *jujuba.*

CARPOMYIA INCOMPLETA Becker
(Pl. II fig. 6 and Pl. I fig. 20)

Beck., Mitteil. Zool. Mus. Berlin, II. 135. 219. (*Trypeta*) (1903); Bez. 1910, 1911, 1913, 1918; Silvestri, Boll. Labor. Zool. Portici, XI. 176. fig. 8. (1916).

DIAGNOSIS:— A characteristic little fly, at once distinguished by its entirely pale yellowish body, the two black spots on the mesophragma and by the incompletely banded wings.

Male and Female. Length of body : 3.3—3.5 mm.; ovipositor : 0.4 mm.; wing : 3.5 mm.

DESCRIPTION:— Head entirely yellow, except on the eye margins, face and cheeks very pale yellowish, owing to a very delicate and minute whitish pulverulence; eyes somewhat elongated, being about one and a half times higher than broad; cheeks broad, proboscis very short and bearing some pale yellow, erect bristly hairs; antennae elongate and narrow, with the third joint pointed at the upper corner of the tip; arista almost bare, blackish, except at the base yellow. There is a row of small blackish hairs on the lower margin of the cheeks and two minute black hairs on the ocellar triangle; all the bristles are brownish except the *prt.*, the *ocp.* and the genal bristles which are pale yellow.

Thorax wholly yellow, with the three usual darker longitudinal lines on the disc, and entirely covered with a delicate whitish pulverulence; scutellum shining yellow ; two characteristic shining rounded black spots are present on the lower side of the mesophragma; in addition there is a small black spot on the upper margin of the pteropleurae, immediately behind the wing base; the pubescence on the disc is very short but fairly dense, even and yellowish; on the scutellum it is much scarcer; the pleurae are almost bare except for a few longer yellowish hairs on the lower side of the mesopleurae and on the sternopleurae; all the bristles are brownish-yellow, but those on the pleurae are somewhat paler.

Abdomen brownish-yellow and covered with a very delicate yellowish-grey pulverulence, except on the upper margins of the second and third segments; male hypopygium small and rounded, yellow, but shining black at the tip and with a yellow, perpendicular middle organ below; it bears some pale yellow erect hairs; female ovipositor shorter than the two apical segments together, brownish-yellow and almost twice as broad on its basal half than on its apical half. The pubescence on the abdomen is uniformly pale yellow and somewhat erect; the strong apical bristles are brownish-yellow.

Legs entirely pale yellow, fairly strong, with the hind tibiae a little bent.

Wings hyaline with three incomplete, pale brownish-yellow bands; the first of these, near the base, extends from the costa to the lower angle of Cu cell; the second band covers the stigma and ends towards the middle of Cu 1 cell, with its outer margin running on the radio-median cross-vein; the third extends from the costa, runs over the median cross-vein to M3 + Cu1; the second and third bands are sometimes interrupted; all the veins are yellow, except R1 for a very short distance near its base, and the radio-median and median cross-veins blackish; costal bristle double. Squamulae whitish; halteres yellow.

This species is common throughout Egypt and its larva breeds in the fruit of *Zizyphus spina-christi* and *Z. jujuba*; the adults may be reared from the fruits from almost every locality during the months of October to May. As far as I am aware there is no record of the capture of the adult out in the fields. *C. incompleta* has a wide geographical distribution, being known from the Sudan (as the "Naleback fruit-fly"), from Erythrea and Italy.

3. MYIOPARDALIS Bezzi.

Bezzi, Mem. Indian Mus. III, (3), 132 (1913).

Well distinguished by the stump on R2+3, the bare R4+5, the very short point of the anal cell, the short proboscis, the strong ocellar bristles and by the colour of the thorax which is yellow with black spots.

Head distinctly longer than broad; frons convex and prominent; face flat, elongated below and without a carina; eyes fairly rounded; cheeks very broad; epistoma not prominent; proboscis short and not geniculate; palpi with bristly hairs only; occiput swollen below; antennae very short, inserted above the middle of the eyes, the third joint about one and a half times the length of the second and pointed at the tip; arista shortly pubescent on both sides. Chaetotaxy of head and thorax complete; *oc.* long and robust; *s.or.*2, *i.or.*3; *vt.*2; *pvt.* weak and long; *ocp.* very inconspicuous; genal bristle indistinct, *scp.* very weak and inconspicuous; *mpl.*2; *pt.* strong. Scutellum rather flattened with black spots and possessing four bristles.

Abdomen rather broad, convex and bristly on the lower half, especially on the apex of the fifth segment; male hypopygium fairly prominent and possessing a perpendicular median organ below; female ovipositor short, rounded with a very small apical joint. Legs robust, rather short, with the middle-tibiae possessing a single spur.

Wings rather narrow, with yellow transverse bands and all the veins straight; costal bristle double; R1 short; R2+3 and R4+5 almost parallel; R2+3 with a stump; R4+5 bare; radio-median cross-vein placed before the middle of 1st M2 cell; median cross-vein perpendicular; inferior angle of Cu cell drawn out into a short point shorter than the median cell.

TYPE : *Carpomyia pardalina* Bigot (1891)

This species was originally placed in the genus *Carpomyia* by Bigot, but in his paper of 1910 Prof. Bezzi has shown that it demands the erection of a new genus. Only one species is known so far, which seems to be indigenous to India and Palestine and most probably occurs in Africa.

MYIOPARDALIS PARDALINA. Bigot
(Pl. II fig. 8 and Pl. I figs. 3 and 24)

Big., Indian Mus. Notes I, 77, pl. 5 fig. 1 (*Carpomyia*) (1891); Cleghorn, l. c., II, 24 (*Carpomyia*) (1893); Lefroy, Indian Ins. Pests, 171, fig. 194 (*Carpomyia*) (1906); Froggat, Report, 112 (*Carpomyia*) (1909); Bezzi, Boll. Labor. Zool. Portici, V, 9, 2, fig. 1, 3, 4 (1910) et Mem. Indian Mus. III. (3), 132 (1913).

DIAGNOSIS:— A yellowish, middle-sized species, easily distinguished by the black spotted thorax, scutellum, and by the four yellow bands on the wings.

Male and *Female*. Length of body : 5.2—7 mm., ovipositor : 0.5 mm., wing : 4—4.8 mm.

DESCRIPTION:— Head entirely yellow; frons prominent but somewhat darkened above the antennae; face almost flat, lighter in the centre than at the sides; cheeks very broad; proboscis short, and as dark as the darkest part of the frons; palpi pale yellow, bearing a few small and rather inconspicuous bristly hairs; occiput swollen below and bearing some yellow hairs on its lower portion; antennae pale yellow, with the very shortly pubescent arista dark brown for more than its apical half. All the bristles are black except the *pvt.* which is yellow and the rather weak genal bristles brownish.

Thorax with a very pale yellow ground colour, bearing conspicuous black spots and three much less distinct thin longitudinal dark yellow stripes on the upper half of the disc. The whole of the thorax is clothed with yellowish pubescence, which is longer on the pleurae; the bristles are black except the *st.* which is brownish, and the almost obsolete *scp.*, which are no more than yellow bristly hairs. The black spots, which, on more than the basal half of the thorax, are on the sides, are disposed as follows : one opaque on the humerus exactly above the *hm.*; one large, shining on its upper half and opaque and emarginate below and extending from the base of the *npl.* to beyond the *prst.* and reaching the suture on its lower side; one much larger on the anterior *sa.* extending laterally somewhat beyond the *dc.*, all shining, deeply emarginate above, less so below, and giving the appearance of two spots running together, indeed sometimes it is divided into two distinct spots; one shining and roundish on the postalar callus (which seems to join the side-spots of the scutellum); finally, a large shining central spot, immediately above the scutellum, which is rounded above and at the sides and straight below. The scutellum is pale yellow, devoid of pubescence and bears five black spots : two on the sides (appearing to run into those of the postalar calli); one central opaque, rounded, oval spot and two elongated

shining spots on the underside; of these one is slightly deeper and shorter, below the tip, and the other longer and almost interrupted in the middle at the base. Pleurae wholly yellow and bearing some pale yellow pubescence.

Abdomen entirely yellow with cinereous cross-bands on the hind margins of the second, third and fourth segments; the fifth segment is somewhat shining; the pubescence is short and pale near the base but longer and darker towards the tip; the apical half of the abdomen bears strong black bristles which are adpressed on the third and fourth segments and erect on the fifth. Venter wholly yellow, with a few black bristles on the fifth segment. Male hypopygium reddish-yellow and shining; female ovipositor short, yellow on its basal half and shining black on its apical half.

Legs entirely yellow, with the front femora in both sexes bearing some bristles, which are yellow and weak on the dorsal surface and much stronger below; the middle and hind coxae also bear a few black bristles.

Wings with all the veins yellow (except the short stump on R2+3 which is dark brown), and with three yellow cross-bands disposed as follows : the one near the base, which is the smallest, extends from below the humeral cross-vein over the M. and Cu. cells and ends in the top of Cu.1 cell; the second which is the widest, extends along the middle of the wing from the costa, over the stigma to about the centre of Cu.1 cell, its outer edge runs along the radio-median cross-vein, this band being widest at its centre and gradually narrowing towards both ends; the third band is situated a little after the middle of the wing and extends just below the costa, over the stump outwardly on R4+5 and bends down, following the upper margin to the tip of the wing, thus forming an angle with the end turned towards the stump on R2+3; all these bands are edged with brown, especially at the tips of the lines forming the third angular band.

Squamulae and halteres yellowish.

Up to the present this species is not indigenous to Egypt. Only 5 specimens are known (2 males and 3 females) in the Ministry of Agriculture's collection labelled "Tul Keram 9.8.1919, bred on Faqus." It is recorded from India, where the larva is known to breed in melons and other cucurbitaceous fruits, to which it is said to be very injurious, more than ninety per cent of the crop apparently being destroyed by it. In that country it is known as the Baluchistan Melon-fly.

4. CERATITIS, Mac Leay.

Mac Leay, Zool. Journ , IV. 475 (1829).

Petalophora, Macq., Suit. à Buff., II.454.5. (1835) et Dipt. Exot., II. 3 part. (1843).
Halterophora, Rond., Dipterol. Ital. Prodr., VII Ortalid. 29. (1870).

As restricted here this genus is easily distinguished from any other by the arista which is pubescent on the upper side only, the oblique position of the median cross-vein, and by the peculiar pattern of the wings.

Head as broad as high; face flat, very broad beneath; epistoma not prominent; cheeks rather broad; antennae inserted at the middle of the eyes, short, the third joint at least twice the length of the second and rounded at the tip; arista very long, shortly pubescent on the upper side only; *s.or.*2, *i.or.*2; *oc.* long and robust; *pvt.* parallel; *ocp.* well developed, black; genal bristle weak; all the bristles are black except the *pvt.* yellow and the genal bristle pale yellowish.

Thorax and scutellum black with conspicuous grey markings owing to a dense shining pulverulence of that colour; chaetotaxy complete; *dc.* nearer to the suture than to the scutellum; 1 *mpl.*; *pt.* strong; the *a.sc.* a little shorter than the *b.sc.* and converging at the apex.

Abdomen broad and short, bristly on the sides and at the end; male hypopygium small but fairly prominent; ovipositor short and flat.

Legs robust, not long; front femora in the male much more bristly than in the female; middle tibiae with a single spur.

Wings very broad and short with yellow and brown cross-bands and blackish streaks at the base; R1 short; R2+3 and R4+5 straight, the latter bristly throughout its length; radio-median cross-vein at the middle of 1st M2 cell; median cross-vein oblique owing to which the inferior angle of 1st M2 cell is acute; M cell a little dilated: Cu 2 very deeply curved in the middle and the lower angle of Cu cell drawn out into a point as long as M cell.

TYPE : *Trypeta capitata*, WIEDEMANN (1824).

This very important genus is represented in the Palaearctic Region by the type only, which has a very wide geographical distribution. However it has many other representatives in the Oriental Region and they all are, without exception, "fruit flies" in the proper sense of the word and cause excessive damage wherever they exist.

The bionomics of *Ceratitis capitata* have been known long ago and has often been studied. The larva feeds on a great variety of cultivated fruits (*) some of these are : peaches, apricots, oranges, tangarines, figs, mangoes and guava.

CERATITIS CAPITATA WIEDEMANN
(Pl II fig. 9).

WIED., Anal. entom., 55 (*Trypeta*) (1824) et 496.29.(*id.*) (1830); MACQ., 454.I. (*Petalophora*) (1835) et 219. (1843); GUER.-MENEV., 198.2. (1843); WESTW., 604. f. (1848); WOLLAST., 123. f. (1858); LW., 123.1. Pl. XXVI. f. 1. (1862); v. RŒD., 132. 1. (1885); HUBBARD, (1885); HENSLOW, 655. (1890); RIL. & HOWARD, 5 et 120. f. (1890); v.d. WULP, 189. (1896); LOUNSBURY, (1898); A. GIARD, 436-439. (1900); WACHTL, 275 (1900); JOHNSON, 79. (1904); MALLY, (1904); BECK., 144. (1905); JOHN, 58. (1905); IHERING, 4.f.2. (*Halterophora*) (1905); HEMPEL, 352 (1905) et 213. (1906); ALDRICH, 601. (1905); BECK., 136. (1908); FROGGATT, 308. (1908).

citripeda MAC LEAY, Zool. Journ., XVI. (1829); HEINEK., 198. (1830);); MACQ., 219. t. XIX. f. 10. (1843); BRAUER, 89. (1883).

? *corsyra* WALK., List Dipt. Brit. Mus., 1042 (1855).

flexuosa WALK., Dipt. Saund., 382. (*Trypeta*) (1856); v. RÖD., 132.1. (*flesuosa*) (1885).

hispanica de BREME, Ann. Soc. entom. Fr., XI. 188. t. VII. f. 1 - 4 (1842); GOUREAU, 43. (1859); SCHIN., 174. (1864); ROND., 29.1. (*Petalophora*) (1870); LABOULB., 441. (1871); MINA PALUMBO. (1882); PERRIS, 439. (1871); ALFONSO & BONAFEDE, 13. (1882); PENZIG, 471. (*Halterophora*) (1887); BERLESE, 1-7.f.1 (1899) et 62.f.22. (1900) ; LEONARDI, 284. f. 148-150. (1900) ; RIBAGA, 35.f.19-30. (1901); BEZ., 276-279 (1909) et 130. (1913); QUAINTANCE. (1912).

DIAGNOSIS:— A very handsome robust species, easily distinguished by the peculiar coloration of the body and wings, the latter being also broad and short and by the large rhomboidal palette-shaped longitudinally striated appendage of the male.

(*) For a complete list of the plants attacked see Appendix (p. 125, 126).

Male and *Female*. Length of body : 4—5 mm.; ovipositor : 0.9—1.2 mm.; wing : 4.5 mm.

DESCRIPTION:— Frons yellow, getting much darker towards the base of the antennae, where it is dark brownish and bearing some blackish erect hairs in the middle; in addition the male only possesses two curious spathulate appendages at the end of two chaetae, which are silvery-grey in colour; face and cheeks yellow; vertex yellow, somewhat shining, with the ocellar triangle brownish-black; proboscis and palpi yellow, bristly; antennae with the two basal segments reddish-brown and the third segment usually yellow; arista blackish.

Thorax black on the disc, very shining, with very characteristic light grey markings which are due to a fine pulverulence of that colour; the black shining areas are as follows : the upper margin of the disc, the centres of the humeral calli, the two large upper corners, two small isolated, rounded spots in a straight line with the suture, two much larger isolated spots below these and the two large inferior corners; the humeral and prealar calli are whitish, except the centre of the former, as stated above, black; the pleurae are whitish and entirely covered with a delicate white tomentum; the mesopleurae possess a tuft of strong erect hairs, which in the male are black and in the female white; there are also some white strong hairs on the pteropleurae and sternopleurae, but these are constant in both sexes; scutellum very shining black like the thorax with a pale yellow band all round the base which is emarginate on both sides and not touching the extreme base; mesophragma dark yellowish-red; the pubescence on the disc and scutellum is short, adpressed and shining pale yellow; it is scarcer on the black areas, and on the scutellum it is not adpressed; all the bristles are black except the *scp.* yellow.

Abdomen orange-yellow with two reddish-brown bands which appear grey owing to a pale whitish pulverulence; the first of these bands occupies the lower half of the second segment and the second band the lower two thirds of the fourth segment; the pubescence is fairly dense, short, erect and blackish and on the lateral margins and apex long and bristly; female ovipositor short, broad, flattened and reddish-yellow.

Legs reddish-yellow with a row of rather long yellow bristles on the hind tibiae and the hairs on the upper side of the front femora are black in the male and yellow in the female.

Wings characterised by their breadth, the deep curve in Cu 2 and by the acute inferior angle of 1st M2 cell The wing markings although almost indescribable are nevertheless characteristic, being

hyaline with black, brown and ochraceous markings with somewhat faded tints as shown in fig. 9 Pl. II.

This well known species has a wider geographical distribution than any other "fruit-fly" and this fact is chiefly due to its extraordinary variety of host plants belonging to no less than twenty four natural orders, as can be seen in the list given on page 125. *C. capitata* is known in almost the whole of Continental Africa, Southern Europe, Azores, India, Australia, New Zealand, South America, Cape Verde Islands, Madeira, Bermuda Islands, Hawaiian Islands and probably the East Indies.

In Egypt it is a very serious pest on peaches, mandarine, orange, sweet orange, and mangoes and the adult may be bred from any of these fruits in their respective seasons.

5. SPHENISCOMYIA, Bezzi.

Bezzi, Mem. Indian Mus., III, (3), 146 (1913).

Spheniscus, Beck., Mitteil. Zool. Mus. Berlin, IV, 138, (*Sphaeniscus*) (1908)

Becker considers this genus allied to *Acidia* and distinguishes it by its bare third vein (R4+5), and the characters of the head. Bezzi states that he erroneously called it *Sphaeniscus*, which name must be amended to *Spheniscus*; however, he further states that in this form the name is twice preoccupied in zoology; in birds (by Brisson, 1760) and in Coleoptera (by Kirby, 1817); he therefore proposed the name *Spheniscomyia*, which I have adopted.

This genus is distinguished by the bare R4+5 vein; the well developed costal bristle; the approximate radio-median and median cross-veins; two pairs of *i.or.*; by the black shining colour of the body; the absence of bristles on the abdomen; and by the pattern of the wings, which is like that of some species of *Urophora*.

Head broader than high; frons broad but becoming somewhat narrower towards the base of the antennae; face concave and narrower than the frons; eyes large and fairly rounded; cheeks narrow; epistoma not prominent in profile; proboscis short and palpi small and bristly; antennae placed just after the middle of the eyes, the third joint pubescent, rounded at the tip and about twice as long as the second joint; arista with a very minute and microscopic pubescence; *oc.* strong; *s.or.*2, *i.or.*2; *vt.* long; *prt.* parallel; genal bristle strong; *ocp.* well developed.

Thorax short, globose, entirely black and possessing a complete chaetotaxy; *mpl.* 1; *pt.* strong; scutellum small, rounded, convex and entirely black; scutellar bristles may either be 2 or 4, in the first case the *a.sc.* are wanting, in the second case they are only a little weaker than the *b.sc.* and converging at the apex. Abdomen short, rounded, convex, distinctly narrowed at the base, devoid of lateral or apical bristles. Male hypopygium small, rounded; female ovipositor long or medium, fairly broad and flattened.

Legs short; front femora with a row of 4-5 bristles below; middle tibiae with a single spur.

Wings normal in shape with a distinct costal bristle; subcosta indistinct; R1 very short, ending a little before the middle of the

wing and well in front of the radio-median cross-vein; R2+3 straight; R4+5 bare; M1 a little undulated; radio-median cross-vein perpendicular, placed near the apical fourth of 1st M2 cell, its distance from the median cross-vein usually equal to its length; inferior angle of Cu cell short and broad, usually shorter than M cell. Wing pattern very characteristic, black with deep hyaline indentations, especially at the hind margin, or in other words, hyaline with four black bands united together at the upper margin except for a short distance towards the middle.

TYPE : *Trypeta quadrincisa* WIEDEMANN (1824).

Apparently only two species of this interesting genus were known in the palaearctic region, *quadrincisa*, Wied, and *sexmaculata* Macq., which have a very wide distribution in South Europe, Africa, Asia and India. The two following Egyptian species do not correspond with the descriptions of the two previously known species and are consequently an important and interesting addition to the genus as well as to our Fauna. I have in addition the valuable confirmation of Prof. Bezzi's opinion on this point. One species differs from the original description of the genus by possessing only two scutellar bristles instead of four. I have named this after Dr. Br. Debski who first found one of the two native species in 1908 and who bred two adults from the inflorescence of *Stachys aegyptiaca*. The larvae live in the floral buds of this plant and feed on the corolla and essential organs of the flowers. Larvae and pupae were found on April 14th, 1908 and the latter hatched on April 20th 1908.

Unfortunately both imagines had been lost before I had the chance of examining them so that it is not possible to state which of these two species was in his possession.

The two Egyptian species seem to be flower-head feeders, as I have bred *S. aegyptiaca* from the floral spikes of *Lavandula coronopifolia* from the Wadi Hoff.

TABLE OF EGYPTIAN SPECIES

1 (2) Scutellum with two bristles; head very dark; hind tibiae with more than their basal halves black .... **1 S. debskii**, EFFLAT.

2 (1) Scutellum with four bristles; head yellow; hind tibiae entirely yellow ...... **2 S. aegyptiaca**, EFFLAT.

SPHENISCOMYIA DEBSKII Efflat.
(Pl. III fig. 9)

Efflat., Bull. Soc. Roy. Entom. d'Egypte, 133. (1923)

DIAGNOSIS:— A small black species which possesses only one pair of *b.sc.*; an entirely dark head; hind tibiae with at least their basal halves black and black wings, which, in addition to the three hyaline indentations, possess a hyaline band near the base leaving more than the upper half of the wing base black.

Male and *Female*. Length of body : 3—3.5 mm., ovipositor : 1.5 mm., wing : 3—3.3mm.

DESCRIPTION:— Frons very dark reddish-brown and dull owing to a very minute greyish pulverulence; face black, very shining, except for a vertical line situated between the hollows of the antennae which possesses a minute grey pubescence; cheeks also covered with grey pubescence above, but very shining black below; epistoma slightly projecting when seen from above; proboscis dark yellowish-brown, with brown bristles; occiput entirely black with the *ocp.* also black; antennae very dark blackish-brown with the third joint covered with a minute light reddish-brown pubescence; all the bristles of the head are black.

Thorax globate, very shining black, with all the bristles black; it also bears a dark reddish brown pubescence which is scattered; scutellum shining black, free from pubescence, and with only one pair of *b.sc.*

Abdomen shining black like the thorax, also bearing reddish-brown hairs, which are rather scattered and become a little longer at the apices of the segments; there are some much longer bristly hairs on the lateral margins of the three apical segments and on the lower margin of the fifth segment. Venter all dull black except for a median longitudinal shining black stripe. Male hypopygium small, rounded and shining black; female ovipositor longer than the abdomen, a little convex above but flat below, shining black and bearing some minute black hairs.

Legs black and yellow; all the femora are black; front and middle tibiae black on their basal halves, and yellow on their apical halves, although sometimes the black is a little more extensive on the middle tibiae, but never as much as on the hind tibiae which are black except the apical fourth yellow; tarsi wholly yellow except the two or three apical joints of the hind tarsi blackish; pubescence on legs black all over.

Wings normal in shape and characterised by having, in addition to the four black bands, a large black spot on the base which

extends from the costa to the base of M1. In other words the wings are black with four hyaline indentations, three of which are deep at the lower margin and one much smaller at the upper margin on the outer side of the stigma, and one complete hyaline band after the black base; the hyaline band extends from the costa after the humeral cross-vein with its outer margin running almost straight and vertically to the lower margin and its inner margin curving inwardly, almost in a semicircle, towards the base of the wing, thus leaving the lower part of the wing base entirely hyaline; the three deep hyaline indentations at the lower margin are disposed as follows : the first in the basal half of the wing, under the stigma, extends from M1 to the lower wing margin where it becomes gradually wider; the second in the apical half of the wing and situated immediately below the short radio-median cross-vein extends also from M1 to the lower wing margin but with its outer margin *well before the curved median cross-vein;* the third indentation in the apical third of the wing extends from R4+5, crossing R5 and 2nd M2 cells to the lower margin; its inner margin follows the same curve as that of the median cross-vein and its distance to this cross-vein is equal to the distance between the outer margin of the second deep indentation and the median cross-vein; its outer margin slants much outwardly, especially below M1 so that the indentation is much wider and more inflated below than above. The small, rather square-shaped indentation at the upper margin is situated at the middle of the wing and extends from the costa to about half way between R2+3 and R4+5, its inner top corner touching the tip of R1.

This and *S. aegyptiaca* are both very common in all the wadis around Helwan and probably wherever the food plant, *Stachys aegyptiaca*, of one of the two species grows. Unfortunately I am not in a position to say which of the two species breed in that plant, but I have collected both species from the *Stachys*, therefore in all probability it is the food plant of both species. My dates for the above species extend from March to May and I have also captured it in October and early November in the Wadi Hoff.

I have recently bred a large series of *S. debskii* from the inflorescence of *Stachys aegyptiaca* collected in the Wadi Hoff (10.IV to 28.V.1924).

SPHENISCOMYIA AEGYPTIACA Efflat.
(Pl. III fig. 2)

Efflat., Bull. Soc. Roy. Entom. d'Egypte, 137. (1923)

DIAGNOSIS:— A small black species, easily distinguished

from *S. debskii* by the four scutellar bristles the yellow face and frons, the yellow hind tibiae, and by the wings which have their basal fourth entirely hyaline.

Male and *Female*. Length of body : 2.3—3 mm., ovipositor : 0.6 mm., wing : 2.7 mm.

DESCRIPTION:— Frons dark yellow in the centre but getting paler towards the eye margins where it is almost white owing to a very minute silvery-white pulverulence; face greyish-yellow in the centre and silvery-white on the sides; cheeks also silvery-white owing to the same minute pulverulence and with a few pale hairs in addition to some pale bristly hairs on the back, beside the genal bristle; proboscis short, dark yellow and with some pale, longish and erect hairs; palpi yellow, with some minute pale bristles amongst which are intermingled a few black ones near the tip; occiput black; vertex dark yellow, slightly narrower than the frons, with the ocellar triangle blackish; antennae yellow with the third joint paler owing to its minute white pubescence; arista black except at the extreme base yellow; all the bristles of the head are black except the *i.or.* which are dark yellow near the base and the genal bristle which is very pale yellow.

Thorax shining black, somewhat aeneous and bearing scattered, whitish, adpressed hairs; all the bristles are black; scutellum very shining aeneous-black and bearing four black bristles; the *b.sc.* are long, strong and parallel and the two *a.sc.* shorter and converging at the apex.

Abdomen entirely shining aeneous-black like the thorax and bearing some small, scattered greyish hairs which are darker and longer at the apices and lateral margins of the three last segments; male hypopygium rounded, dark reddish-brown and bearing a very delicate but longish dark grey pubescence; female ovipositor as long as the five abdominal segments together, very shining black and possessing a pubescence very similar to that of the abdomen.

Legs with all the front, middle and hind femora blackish except the extreme tip yellow and the tibiae and all the tarsi wholly yellow; pubescence on legs blackish, but somewhat lighter on the front legs.

Wings black with the basal fourth entirely hyaline, one small hyaline indentation at the upper margin in the middle and three deep hyaline indentations at the lower margin; the upper small indentation is triangular in shape with the base of the triangle on the costa, immediately after the stigma, its inner basal angle touching the tip of R1, and its apex just passing over R2+3; the three deep lower indentations are disposed as follows : the first inner one, which is the broadest, is situated below the stigma and extends from M1 to the lower wing margin; the second indentation which is the

shortest, extends also from M1 to the lower margin but with its *inner lateral margin running on the median cross-vein*; the lateral margins of these two indentations are almost parallel to each other; the third indentation which is somewhat undulated and situated in the apical fourth of the wing, extends from just above R4+5 and downwards across M1 to the lower wing margin; all these three indentations very gradually widen from their bases to the lower margin of the wing; the radio-median cross-vein is close to the median cross-vein being at a distance from it which is equal to its own length. Squamulae and halteres yellowish.

I have bred one adult of this species from the floral spikes of *Lavandula coronopifolia* which I had collected in Wadi Hussein. It very probably, however, also lives on *Stachys aegyptiaca*, upon which plant it may commonly be found from February to June together with its closely allied species, *S. debskii* in all the wadis near Helwan. I have captured it myself in February, March, April, May and June 10th in the Wadi Hoff, Wadi Rashid, Wadi Hussein, Wadi Rishrash as well as along the Suez Road, always on the *Stachys* and also by "sweeping" the flowering spikes of *Lavandula*.

6. METASPHENISCUS, Hendel.

Hend., Wien. Entom. Zeitg., XXXIII. III. u. IV. 92. 116 (1914)

Very close to *Spheniscomyia* but distinguished from it, and from other genera, by the third antennal joint, which is at least three times as long as broad, by the white bristles of the occipital row, and the general metallic ground colour of the body.

Head as high as broad; face and frons as in *Spheniscomyia*, eyes large, more or less rounded; frons and epistoma a little prominent; cheeks narrow; antennae placed at the middle of the eyes, with the third joint rounded at the tip, and three times as long as the second joint; arista bare or at most microscopically pubescent; cephalic chaetotaxy very strong and complete; *oc.* strong; *s.or.* 2, *i.or.* 3; *vt.* very long; *pvt.* divergent; *ocp.* very strong, white; genal bristle very strong. Proboscis very short; palpi bristly.

Thorax convex, somewhat more elongated than in the preceding genus, of a black colour, but owing to its being entirely covered with a fine grey tomentum, it appears a curious metallic grey; chaetotaxy strong and complete; 1 *mpl.*; scutellum with four bristles, the *a.sc.* much weaker than the *b.sc.* and converging at the apex. Abdomen very similar to *Sphemiscomyia* in shape and colour, with apical bristles in the male; ovipositor long, fairly broad, and flattened. Legs fairly short; front femora with a row of bristles below; middle tibiae with a single spur.

Wings very broad and rather long, black, with hyaline indentations at the front and hind borders; R1 short, ending well in front of the radio-median cross-vein; this latter is not perpendicular and its distance from the median cross-vein is equal to more than its length; median cross-vein perpendicular and long; posterior angle of Cu cell shorter than M. cell; costal bristle double.

TYPE : *Trypeta gracilipes* Loew (1862).

This artificial genus was founded by Hendel (1914) on Loew's species from Egypt.

METASPHENISCUS GRACILIPES, Loew.
(Pl. II, fig. 10)

Lw., Berlin. Entom. Zeitschr., VI. 90. (182)
cyclopica, Bez., Bull. Soc. Entom. Ital., XXXIX. I-IV. 152. 213. (*Acidia*) (1908) et Bull. Entom. Research, IV. I. 23.3. (*Tephrella*) (1918).
w-fuscum. Enderl., Zool. Jahrb., XXXI. 425. (*Tephrella*) (1911).

DIAGNOSIS:— A small, pretty species with a metallic black body; black wings, which possesses two hyaline indentations on the front border and three on the hind border, as well as an isolated hyaline spot; and a long, broad and flattened ovipositor.

Male and *Female*. Length of body : 4.5—5.4 mm., ovipositor : ? 5 mm., wing : 5 mm.

DESCRIPTION:— Head entirely dull reddish-yellow and covered with pale tomentum, except the ocellar triangle blackish and the epistoma shining black; on the cheeks there are some minute, blackish, bristly hairs; all the bristles are dark brown except the strong and characteristic *ocp.* white.

Thorax, on the disc and pleurae, as well as the scutellum, of a uniform black ground colour and entirely covered with a dense and fine pale dust, which gives it a very dull grey appearance; when held, however, in certain lights the three usual longitudinal lines are well seen on the disc; the pubescence is very short, adpressed and pale; all the bristles are yellowish-brown and towards the apex blackish

Abdomen of a characteristic metallic black colour, rather shining, and possessing a short, adpressed brown pubescence; on the apex of the fifth segment, in the male only, there is a row of blackish bristles Male hypopygium small, globular, shining black, and bearing some bristles; female ovipositor longer than the abdomen and shining metallic black.

Legs entirely reddish-yellow.

Wings fairly large and elongate, black with deep hyaline indentations at the front and hind borders; the 1st and 2nd Costal cells are hyaline as well as the entire wing base; in the front border there are two hyaline indentations and one oval hyaline spot; the first indentation is immediately after the stigma, with its inner margin touching the latter, and extending downwards as far as R4+5 before the radio-median cross vein; the second indentation is a little deeper, situated after the radio-median cross-vein and reaching down about half way between R4+5 and M1; the oval hya-

line spot is in the apical fifth of the wing in R3 cell, with its upper and lower margins touching R2+3 and R4+5 respectively; on the hind border the axillary lobe is entirely hyaline and there are three deep hyaline indentations; the first of these is the largest, situated below the stigma towards the centre of Cu1 cell with its upper margin going just beyond M3+Cu1; the second hyaline indentation is the smallest and situated near the apex of Cu1 cell immediately below the radio-median cross-vein with its upper margin not reaching M3+Cu1; the third indentation begins at the tip of M3+Cu1 and its upper margin touching M1; the inner margin of this indentation is straight and touches the median cross-vein above, while its outer margin is wavy; in addition there are two minute indentations, in the shape of spots, towards the middle of 2nd M2 cell.

Squamulae whitish, halteres reddish-yellow.

Of this interesting species only five specimens were known all of which belonged to the Vienna Museum. They simply bear the label "Natt. 1858, Egypt." It has been found since in Erythrea and redescribed by Bezzi (1908) as *Tephrella cyclopica* and by Enderlein (1911) as *Tephrella w-fuscum*.

This is another species which is only known by the vague locality "Egypt" and for the reasons stated above on p. 30 for the present this species is only a doubtful member of the Egyptian fauna.

7. ACIURA, Robineau-Desvoidy

Rob.-Desv., Myod., 773. 12 (1830).

Platyparea p.p., Lw., Trypetid., 26. (1862).

Allied to *Spheniscomyia* but distinguished from it as well as from other genera by the presence always of only one pair of *b.sc.*, the 3 *i.or.*, and usually by the pattern of the wings which are black with hyaline indentations and hyaline spots.

Head broader than high; frons very slightly narrowed forward; face a little concave; eyes large and rounded; cheeks narrow; epistoma not prominent; proboscis short; palpi small and bristly; antennae inserted towards the middle of the eyes, with the third joint rounded, fairly pointed at the end and delicately pubescent; arista short, pubescent or almost bare; *oc.* present, weak or strong; *s.or.*2, *i.or.*3, or *s.or.*1, *i.or.*3; *pct.* parallel; *ocp.* weak to well developed. The chaetotaxy of the head is composed of bristles which vary from black and thin in the typical species to all yellow and thin in some American species, while in one Indian species (*xanthotrica*, Bezzi) those on the vertex are yellow, short and stout and the others black; all these above mentioned characters show decidedly, in my opinion, that the genus is still composed of heterogeneous elements.

Thorax very convex, rounded and with a complete chaetotaxy; *pt.* strong; 1 strong *mpl.*; scutellum small, convex and bearing only two strong *b.sc.*

Abdomen convex, narrowed at the base and with or without small apical and lateral bristles. Ovipositor very variable, either short, broad and flattened, or long narrow and less flattened, or it may be longer than the abdomen.

Legs normal in shape and size with the front femora bristly below and the middle tibiae bearing a single spur.

Wings elongated, black with both hyaline indentations and discal spots, and with the pattern variable; there are usually two hyaline triangular indentations in the middle of the costa after the stigma, while in *Spheniscomyia* only one such indentation is present. R1 very short, ending well before the middle of the wing; R2+3, R4+5 and M1 rather curved; R4+5 bare; radio-median and median cross veins approximate, the former being placed in the

apical fourth of 1st M2 cell; inferior angle of Cu cell more or less drawn out into a point which is never long.

TYPE : *Aciura coryli* Rossi (1890)

The species of this genus appear to be uncommon. The only species so far known from Egypt, which is one of the typical forms, is an important and interesting addition to our dipterous fauna. Not more than eight species of this genus are known from the Palaeartic Region, of these only three are typical (*femoralis*, Rob.-Desv., *rotundiventris*, Fall. and *tibialis* Rob.-Desv.); the others show a different wing pattern. The European species *A. femoralis* Rob.-Desv. has been bred from the thalamus of *Phlomis fructicosus* by Frauenfeld.

ACIURA TIBIALIS, Robineau-Desvoidy.
(Pl. IV fig. 8 and Pl. I fig. 18)

Rob.-Desv., Myod., 773.3. (1830); Trypet., 30.2.t.11. f. 1. (1862); Schin., Faun. Austr., II. 113. (1864); Lw., Zeitschr. f.d. ges. Naturw. XXXIV.2. (1869); Rond., Dipterol. Ital. Prodr., VII. (Ortalid.) 37.2. (1871); Beck., Annuair. d. Mus. Zool. d l'Acad. Imp. Sc. d. St. Petersb., XVII. 644, 314. (1912).

gagates, Lw., Linn. entom. I. 505. t. III. f. 16. (*Trypeta*) (1846); Schin., Verh. zool.-bot. Ges. Wien, VIII. 653. 24. (1858).

DIAGNOSIS:— A small, very shining black species, with beautiful black wings which possess hyaline indentations and hyaline discal spots.

Male and Female. Length of body : 3.2 mm.; ovipositor : 0.6 mm.; wing : 2.9—3.2 mm.

DESCRIPTION:— Frons shining dark reddish-brown to almost blackish, usually even darker near the margin of the eyes; face and cheeks yellowish-brown and entirely covered with a very minute whitish pulverulence; proboscis dark yellowish to reddish-brown and bearing a few bristly hairs; palpi small, with the small bristles mostly pale, but some black; occiput shining black; vertex dark reddish-brown like the frons but blackened around the ocellar triangle; antennae reddish-yellow, with the rounded third joint covered with a very minute pale yellow pubescence and the arista almost bare, blackish on its apical half but reddish-yellow on its

basal half; *s.or.*1, *i.or.*3; *oc.* very weak; *ocp.* distinct; all the bristles are black.

Thorax and scutellum extremely shining black and almost free from pubescence, however the few scattered hairs which are present are black; all the bristles are black.

Abdomen entirely black, shining, with a short blackish pubescence except at the apex where it becomes somewhat bristly; female ovipositor longer than the two apical segments of the abdomen together, flattened, rather pointed at the tip and entirely shining black; it possesses a very minute and inconspicuous pubescence.

Legs with all the femora black except the extreme tip dark yellowish-brown; front tibiae and tarsi wholly yellow; middle tibiae yellowish-brown and somewhat darkened for two thirds of their length from the base but with the apical third yellow; hind tibiae blackish except at the extreme tip yellow; middle and hind tarsi wholly reddish-yellow; the front femora possess below two rows of about eight small black bristles each, one row on the outer and one on the inner margin. The pubescence on the legs is fairly short and uniformly blackish.

Wings black with six hyaline indentations and three hyaline discal spots; the indentations are disposed as follows : one oblique, before the stigma, extending from the costa and running to the base of the wing and to the lower margin, covering more than the lower half of the extreme base and the alula, being narrow above and much broader below; two triangular indentations at the upper margin, toward the middle, close to each other, the inner top angle of the inner one touching the stigma; the vertex of both these triangles always extends beyond R2+3 and the costa is yellow in correspondance with these triangles, the vertex of the second triangle being exactly above the radio-median cross-vein. The three remaining indentations are at the hind margin and are almost equidistant from each other; the first, which is the smallest, is oblong and situated in the base of Cu1 cell with the apex well before M3+Cu1; the second, which is larger than the first is in the apex of Cu1 cell, its apex touching M3+Cu1; the third is in the base of 2nd M2 cell with its apex touching the middle of the median cross-vein; it is the longest and broadest of the three lower indentations, very pointed at the apex and very broad at the base forming somewhat a right angled triangle. The three hyaline rounded spots are : one near the base of 1st M2 cell, its upper margin touching M1; one (the smallest) in the upper half and at the apex of 1st M2 cell but never touching any of the neighbouring veins; the third, which is sometimes oval, in the basal half of R5 cell in the middle; these spots are somewhat variable in size, shape and rarely in position. Costal bristle distinct although small; stigma deep black with its superior angle

yellow; radio-median cross-vein close to the median cross-vein, being at a distance from it which is about equal to its own length.

Squamulae and halteres pale yellow.

I have captured this beautiful species so far in the Wadi Hoff only, by "sweeping" the floral spikes of *Lavandula*. My records extend from end of April to about June 15th. *A. Tibialis* seems to be rare and is new to our fauna, it is known from South Europe, i.e. Italy, Spain, Portugal, South of France and Loew states that Zeller has once found it in South Austria (Styria). This species has also been recorded from Madeira Island, Persia and Morocco.

I have lately bred this interesting species from the inflorescence of *Lavandula coronopifolia* collected in Wadi Hoff on 8.V.1924. one ♀ emerged on 10.V. and 2 ♂ ♂ and 1 ♀ on 12.V.24.

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8. MYOPITES, Brébisson.

Bréb., Mém. Soc. Linn. de Normand., 1826-27

Stylia p.p. Rob.-Desv., Myod., 755 (1830).

Distinguished by the shape of the head, the strong *oc.*, the very long and geniculate proboscis, the obsolete costal bristle and by the obtuse inferior angle of Cu cell.

Head much deeper than high and deeper than broad; frons broad and very elongated; face short, concave; eyes fairly rounded; cheeks narrow to medium; epistoma very prominent and the mouth opening, which is proportionately wide, is very elongated; proboscis very long and geniculate; palpi large and prominent but not broad and bearing minute bristles; antennae short but stout; the third joint, which is less than one and a half times the length of the second, is rounded at the tip but not pointed and bears a very minute but dense pubescence; arista short and microscopically pubescent; *pvt.* weak and parallel; *oc.* strong; *s.or.*1, *i.or.*2; genal bristle and *ocp.* well developed.

Thorax rather elongated, convex with a complete chaetotaxy; scutellum with four bristles.

Abdomen elongated, usually with the lower margins of the segments protruding in the centre, especially in the male; female ovipositor long, conical and not flattened.

Legs normal; middle tibia with a single spur.

Wings comparatively narrow and elongated, pellucid with elongated brownish or yellowish-brown spots forming transverse half-bands and rarely complete bands; costal bristle obsolete; R4+5 bare; M1 not straight, its apical third convergent to R4+5; radio-median cross-vein placed towards the middle of 1st M2 cell; inferior angle of Cu cell obtuse.

TYPE : *Myopites blotii* Brébisson (1830).

So far only one species is recorded from Egypt, but nothing is known about its life-history. In Europe another species (*M. inulae.* v. Ros.) has been bred from species of *Inula* and *Pulicaria.*

MYOPITES VARIOFASCIATA, Becker.
(Pl. IV fig. 7 and Pl I figs 5 and 7)

Beck., Mittell. Zool. Mus. Berlin, II 131-132 (1903)

DIAGNOSIS:— A small brownish species, easily distinguished by the long geniculate proboscis, the absence of the costal bristle and by the obtuse inferior angle of Cu cell.

Male and *Female*. Length of body : 3.2 mm.; ovipositor : 1 mm., wing : 2.5 mm.

DESCRIPTION:— Head entirely yellow; cheeks and palpi pale yellow, the latter bearing some minute black bristles; occiput black; vertex fairly broad with the black ocellar triangle very conspicuous and covered with a minute pale yellow pubescence; arista black except at the base which is yellow; all the bristles are black.

Thorax very dark reddish-brown, almost black, except on the calli which are yellow, and entirely covered with a dense shining golden-yellow pulverulence, which is paler and coarser on the pleurae; scutellum yellow except on the two basal corners and the extreme base blackish and bearing 4 bristles; all the bristles are black.

Abdomen black with a broad median longitudinal dark yellow band which is emarginate on the sides; in addition there are some black spots in this yellow band, two on each segment and situated one on each side of the median line; the two on the first segment are the broadest, elongated horizontally, with their outer margin running into the black colour of the abdomen; the three other pairs of spots (one pair on each of the second, third and fourth segments) are smaller, elongated vertically and situated near the base of the segments The pubescence on the abdomen is greyish and very minute, except on the lower margins of the two apical segments where it is very long and blackish, and at the tip bristly; fifth abdominal segment small and entirely shining black; male hypopygium small, rounded, black at the base and reddish-yellow at the apex; female ovipositor almost as long as the abdomen, shining black except the apical part which is reddish with two longitudinal black lines.

Legs entirely reddish-yellow with the usual short blackish pubescence.

Wings hyaline, yellowish-brown at the base, with five transverse bands, two of which, the second and fourth, are almost complete and the others incomplete; the first band is situated near the base between R1 and Cu2+2nd A and covering M and Cu cells; the second, situated at about the middle of the wing, extends from the costa, over the radio-median cross-vein, almost touching the lower wing margin and its inner margin touching the deep yellow stigma;

the third band begins on the costa, runs over R2+3 and ends on R4+5; the fourth extends from the costa at the tip of R2+3, covering the median cross-vein, the tip of M3+Cu1, to the lower margin of the wing; the fifth is in reality more of a spot than a band and may be triangular or quadrate in shape; it covers the apices of R4+5 and M1 and always goes beyond this vein. Squamulae and halteres yellow.

A small, interesting and apparently rare species which seems to occur only in Alexandria and its neighbourhood. I have captured three specimens, two males and one female at Cleopatra by sweeping in low herbage on August 10th and 14th, 1921. Unfortunately I have not been able to find this species since, although I have carefully searched for it in the same locality, but at a slightly earlier date (towards the beginning of July). Becker had originally found it and captured a small series in Alexandria in November, so that in all probability it may prove to be commoner during the autumn and winter. The food plant is unknown.

9. UROPHORA, Robineau-Desvoidy.

Rob.-Desv., Myod., 769. 12 (1830)

Distinguished by the 1 *s.or.*, 2 *i.or;* the four scutellar bristles; the very weak costal bristle and the obtuse inferior angle of Cu cell.

Head broader than high and usually more or less yellow; frons broad, not prominent; face short and flat; eyes fairly rounded; cheeks broad; epistoma not prominent; proboscis a little elongated and geniculate; palpi small, flat and bristly; antennae with the third joint stout, twice longer than broad, straight above and rounded below; arista microscopically pubescent; *s.or.*1, short, *i.or.*2; *oc.* strong *pvt.* parallel; genal bristle present; *ocp.* strong and well developed; all the bristles are black.

Thorax short, convex, entirely black on the disc and the pleurae, except for some yellow spots on the humerus and on the upper margins of the mesopleurae and pteropleurae; scutellum usually more or less yellow. Chaetotaxy of the thorax complete; *mpl.* 2; *a.sc.*2, *b.sc.*2; all the bristles are black.

Abdomen elongated, distinctly narrow at the base, convex, entirely black, with lateral and apical bristles; female ovipositor long, conical, shining black, somewhat swollen at the base and not flattened.

Legs with the front femora bearing rows of bristles and the middle tibiae a single spur.

Wings proportionately small, hyaline and usually with four black bands united together above the middle of the wing; some palaeartic species however possess entirely hyaline wings. Costal bristle very weak, almost obsolete; R4+5 bare, a little undulated and parallel with M1; radio-median cross-vein placed towards the middle of 1st M2 cell: inferior angle of Cu cell very obtuse.

TYPE : *Musca solstitialis* Linnaeus (1758).

About thirty species are known from the palaearctic region, two of which are known so far from Egypt, *macrura* Lw. and *quadrifasciata* Meig. They both seem to be flower-head feeders; the former is believed to breed in the heads of *Onopordon* and *Centaurea* sp. and the latter in the heads of Centaurea sp. I have captured the latter commonly on *Centaurea pallescens* together with *Trypanea jaceae* Rob.-Desv.

TABLE OF EGYPTIAN SPECIES

1 (2) Middle and hind femora entirely yellow; wings with the first and second bands widely separated .... **1 macrura** Lw.

2 (1) Front, middle and hind tibiae black except at the tip; wings with the first and second bands united above .... **2 quadrifasciata,** Meig.

UROPHORA MACRURA Loew
(Pl. III fig. 1 and pl. I figs. 4 and 16)

Lw., Stettin. entom. Zeitg., XVI. 40 (*Trypeta*) (1855) et Trypetid., 69.4. tab. XI. fig. 1 (1862); Frfld., Sitzungs. Kais. Akad. Wiss., XXII. 549 (1856); Schin., Verh. zool.-bot. Ges. Wien, VIII. 654.28 (1858) et Faun. Austr., Dipt., II. 137 (1864); Kaltenb., Pflanzenf., 380.69 et 382.13 et 387.61 (*Trypeta*) (1872); Fitch., The Entom., XV. 138 (1882).

lejura Rond., Dipterol. Ital. Prodr., VII. Tephrit. 19.16 (1870).

DIAGNOSIS:— A small black species, easily distinguished by the entirely yellow middle and hind femora and by the pattern of the wings which possess the first and second bands well separated.

Male and *Female*. Length of body : 4.5–5 mm.; ovipositor : 3.5–4 mm., wing : 4.7 mm.

DESCRIPTION:— Frons reddish-yellow; face very pale yellow; cheeks broad, pale yellow and possessing in addition to the genal bristle two longitudinal rows of minute black bristles; proboscis pale reddish-yellow with a few erect hairs; palpi pale yellow except at the tip reddish-yellow and bearing some minute black bristles; occiput for the most part blackish except above where it is usually dark brownish-yellow; antennae reddish-yellow, with the arista black except at the base yellow.

Thorax entirely black on the disc and covered with a minute, dense, greyish-yellow pulverulence, except on the fore, hind and lateral margins; the humeri and the upper thirds of the mesopleurae and pteropleurae are pale yellow; the rest of the pleurae are all shining black; the pubescence on the disc is short and black, but erect and bristly; it is somewhat longer and bristly on the humeri; scutellum

pale yellow except on the extreme basal corners blackish; all the bristles are black.

Abdomen entirely shining black with a dense, black and erect pubescence, which becomes much longer and bristly on the sides and at the apex; on the whole the pubescence is denser and stronger than in *U. quadrifasciata*; female ovipositor very long, narrow, cylindrical and about once and a half to twice the length of the abdomen; it is somewhat swollen and broader on its basal fourth, but much less so than in the following species, entirely shining black and possessing a black, even, erect and fairly short bristly pubescence.

Legs entirely yellow except for an elongated black spot on the outer side of the front femora which extends from the base to about two thirds of the length of the joint; in addition the front femora bear three rows of black bristles, two rows above and one below; the pubescence on the legs is uniformly black, even and fairly dense.

Wings hyaline, except the basal fourth dark yellowish and with four black transverse bands disposed as follows : the first is more like an elongated spot and extends from the costa, before the stigma, to about the middle of Cu2+2nd A, almost entirely covering the M and Cu cells; the second band, situated across the middle of the wing, is entire, almost perpendicular and extends from the costa to the lower margin, covering the outer half of the stigma and the radiomedian cross-vein; the third and fourth bands are united together in R3 cell; the first of these two bands is undulated and covers the median cross-vein as well as the tip of M3+Cu1 and the second covers the apices of R4+5 and M1; in other words the apical third of the wing may be described as black with a deep triangular hyaline indentation at the lower margin, the vertex of which almost reaching R2+3; the stigma, the costa and all the veins are yellow in correspondance with the hyaline colour and black with the bands; costal bristle weak.

This is a common species throughout Egypt and I strongly suspect it to breed in *Onopordon ambiguum* as I have always captured it on this plant from March to May. It very likely also breeds in other Compositae as it is quite common in my garden in Shoubrah, where I am quite certain there are no species of *Onopordon* growing, but plenty of Chrysanthemums, Asters, Cosmeas, etc. My records extend from March to July.

It is known from Greece and throughout Central and South Europe and it very probably occurs in many other parts of the world.

UROPHORA QUADRIFASCIATA MEIGEN
(Pl. III fig. 8)

MEIG., Syst. Beschr., V. 331. 29. t. XLIX. f. 3. (*Trypeta*) (1826); MACQ., Suit. à Buff., II. 457. 10. (1835); LW., Germ. Zeitschr., V. 360. t.I.f. 28. (*Trypeta*) (1844); GOUREAU, Ann. Soc. entom. France, II. 3. 86. (1845); LW. Linn entom., I. 508 31. (*Trypeta*) (1846); SCHOLTZ, Zeitschr. f. Entom. Breslau, 14. (1848); FRFLD., Sitzungsber. d. Kais. Akad. d. Wiss., XXII. 552. (1856); DUF., Ann. Soc. entom. France, 53. (1857); SCHIN., Verh. zool.-bot. Ges. Wien, VIII. 657. 34. (1858); LW., Trypetid., 75. 13. t. XII. f.4. (1862); SCHIN., Faun. Austr., II. 139. (1864); ROND., Dipter. Ital. Prodr., VII. 20. 13 (*Tephritis*) (1870); KALTENB., Pflanzenf., 386. 50. (*Trypeta*) (1872).

DIAGNOSIS:— A small black species, somewhat smaller than *U. macrura*, but distinguished from it by its femora which are black except for the tip yellow and by the wings which possess the two first bands united above.

Male and *Female:*— Length of body : 3—3.5 mm.; ovipositor : 1.9 mm.; wing : 2.8—3 mm.

DESCRIPTION:— Head very similar to that of *U. macrura* but the thorax is shining black owing to the much finer and scarcer brownish-yellow pulverulence on the disc, leaving the three usual longitudinal lines more pronounced although inconspicuous; the humerus is black and usually only with a small yellow spot below.

Abdomen very similar to the preceding species but the pubescence is not as dense and somewhat less bristly; the ovipositor, which is distinctly shorter, is much more swollen in its basal half.

Legs with all the femora black except for the apices which are yellow; tibiae and tarsi wholly yellow.

Wings characterised by the pattern, which differs from that of *U. macrura* as follows; the two first black bands are united above near the base of R4+5, thus leaving the basal third of R3 and R1 cells, the subcostal cell, the stigma and the whole of the 2nd costal cell black; the union of the third and fourth black bands is thicker and the vertex of the deep hyaline indentation (limited by these bands) never passes R4+5.

Squamulae and halteres yellowish.

I have often captured this species in the neighbourhoods of Cairo on *Centaurea pallescens*, Linn. in the flower-heads of which plant the larva lives, together with the larva of *Terellia jaceae*

Rob.-Desv. In all probability it will be found common wherever its widely distributed food-plant grows. My dates extend from March to June. In central and Southern Europe this species is known to breed in different species of *Centaurea*, such as *jaceae*, *paniculata*, *nigra* etc. *U. quadrifasciata* has also lately been recorded from Spain (Catalonia) by Codina.

Lately I have bred *U. quadrifasciata* from the capitulum of *Centaurea pallescens* collected at Kerdacé (3.V.1924). Three specimens, 1 ♂ and 2 ♀ ♀ emerged on 10.V.1924.

10. SCHISTOPTERUM, Becker.

Beck., Mitteil. Zool. Mus. Berlin, II, 137, (1903).

Easily distinguished by the cleft in the costa, the greatly curved veins, the indistinct stigma and the two costal bristles.

Head broader than high; frons convex and prominent; face very short, with a carina, and distinctly concave owing to the prominent epistoma; eyes large, somewhat elongated, not distinctly pointed; proboscis short and not geniculate; palpi broad and flat, protruding and feebly bristly; vertex broad and flattened; antennae inserted below the middle of the eyes, elongated and slender, the third joint about one and a half times as long as the second, tapering gradually towards the tip, but not ending in a fine point; arista short and bare; *oc.* extremely weak, almost obsolete; *s.or.*1, *i.or.*2; *vt.*2; *pvt.* short but strong; genal bristle distinct, yellowish-brown; *ocp* weak, indistinct and pale.

Thorax almost globose, with a complete chaetotaxy; *scp.* short and pale; *dc.* long and strong; *hm.*2, one fairly long and dark yellowish-brown, the lower small, weak and pale; *pt.* not long but strong. Scutellum very large, rather rounded with four bristles, the *b.sc.* very long and the *a.sc.* very short.

Abdomen broad but not longer than the thorax, bristly at the tip. Male hypopygium not prominent, of medium size; female ovipositor flat below, with the basal joint as long as the fourth and fifth joints of the abdomen together, and the apical joint invisible.

Wings well characterised by a strong cleft in the costa, immediately before the stigma, thus forming a projecting extremity with two short bristles at the tip; stigma very small, indistinct and situated immediately below the cleft. Most of the longitudinal veins are very much curved and some extremely short; the subcosta is very short, somewat S-shaped and indistinct; R1 extremely short, ending in a deep curve, almost a semicircle, bordering the outer margin of the stigma; R2+3 also short, curving suddenly almost at right angles and ending at about the middle of the costa; R4+5 gently curved, slightly S-shaped and ending exactly at the tip of the wing; M1 much curved away from R4+5; radio-median cross-vein almost indistinct, placed after the middle of 1st M2 cell; inferior angle of Cu. cell not drawn out into a sharp point; M1 curved posteriorly almost at right angles.

TYPE : *Schistopterum moebiusi* Becker (1903).

This is the only species of this curious and interesting genus known up to the present, which, owing to the above mentioned characters stands well apart from any other known genus in this family. It breeds in the capitulum of *Pluchea dioscoridis* from which plant I have bred the adults.

SCHISTOPTERUM MOEBIUSI, Becker
(Pl. III fig. 5 and pl. I figs. 2 and 10)

Beck., Mitteil. Zool. Mus. Berlin, II, 137 (1903).

DIAGNOSIS:— A small black species with very beautiful and characteristic wings, possessing a cleft above the minute stigma, and with the veins greatly curved and some very short.

Male and *Female*. Length of body : 1.7–2 mm., ovipositor : 0.5 mm., wing : 1.7–1.9 mm.

DESCRIPTION:— Head wholly shining dark yellow; frons prominent, dark yellow to yellowish-brown; face dark yellowish-brown, very short, concave with a carina; cheeks less shining, yellow, normal; epistoma very broad, prominent, dark yellow, except for an elongated triangular dark spot on each side; proboscis very short and not geniculate, palpi rather long, prominent, broad and very flat, with more than their basal halves yellow and their apical third black; they are covered with a very minute and delicate pubescence; occiput flat, blackish; vertex broad, flat and dull yellow with the small shining black vertical triangle very conspicuous; antennae inserted immediately below the middle of the eyes, the third joint at least three times as long as broad, gradually tapering to the apex, with its apical half, as well as the dorsal edge of its basal half, black and the remaining part yellow; arista a little longer than the third joint, thin, pale yellow. All the bristles are dark yellowish-brown except the short outer *rt* and the *prt.* which are white.

Thorax globose, especially on the side margins, dull black owing to a very fine greyish pulverulence, and possessing short, white, rather adpressed hairs, which are thinly scattered over the thorax, and scarcer on the pleurae and scutellum. The bristles are long and brownish-yellow.

Abdomen entirely black with the four basal segments also dull owing to the same fine greyish pulverulence, but the apical half (fifth segment and ovipositor) shining; male hypopygium medium in size and bearing some minute hairs. The ovipositor is almost as long as half the length of the abdomen and possesses some very deli-

cate and inconspicuous greyish-yellow hairs; the hind margins of the four basal segments possess each a row of adpressed white hairs, and those on the hind margin of the 5th segment are much longer, less adpressed, and brown; all the abdomen possesses in addition an inconspicuous dark brown pubescence.

Legs brown and yellow; front and middle femora very dark brown except at the extreme tip which is yellowish-brown, and the front tibiae yellow, except for a short distance on the outer margin near the base which is dark brown; middle tibiae with their basal halves blackish-brown; hind legs with the femora entirely black and the tibiae black except their apical thirds which are yellow; all the tarsi wholly yellow. The pubescence on the legs is medium and for the most part dark brownish

Wings with their basal halves dark and their apical halves almost without markings; these consist only of five brownish-black narrow bands and spots of various colours which show through the blackish-brown ground colour of the basal half; the first band which is the shortest, thickest and darkest, is situated before the middle of the wing and extends from R2+3 crossing R1 vertically, covering the stigma to the costa and its outer margin ending with the projecting extremity of the costal cleft; the second band, immediately after the middle of the wing runs up vertically from R4+5 to the costa with its apical third covering the tip of R2+3; the third, fourth and fifth bands seem to originate from one main band running over R4+5 and ending at about three-quarters of the length of this vein by the bifurcation of the third and fourth bands; the third runs outwardly and upwards to the costa and the fourth downwards and outwardly to the lower wing margin covering the end of M1; the fifth band is short, vertical, situated exactly beneath and in a straight line with the second band; the most conspicuous of the spots on the basal half is a deep yellow rounded spot between R2+3 and R4+5; in addition, there are three dark reddish-brown spots, one elongated and triangular, between R2+3 and R4+5 (almost touching the deep yellow spot), the second oval, at the end of 1st M2 cell, and the third, which is the smallest, immediately after the median cross-vein in 2nd M2 cell with its upper margin touching M1; the arrangement of the white spots is as follows : one large spot above the deep yellow one; one elongated and rather pointed below, just before the stigma; one small spot entirely covering the very inconspicuous radio-median cross-vein; one fairly large and elongated spot near the base and lower end of 2nd M2 cell; one small spot in 1st M2 cell; three small and one larger round spots in Cu1 cell; three small and one larger round spots in Cu1 cell, and two small rounded spots in 2nd A cell; in addition there is a small black spot at the apex of R4+5.

This small but beautiful species is very common throughout Lower Egypt. It seems to be found wherever the shrub *Pluchea dioscoridis* grows, in the inflorescence of which the larva feeds and lives. I have bred it from the inflorescence of this plant (together with *Terellia planiscutellata* Beck.) from Ghezireh, Maadi, Barrage and Alexandria, and Becker has captured the adults on the same plant in the desert near Siala (Fayum). My dates extend from March to November.

11. TERELLIA, Robineau-Desvoidy.

Rob.-Desv., Myod., 758. (1830).
Orellia, Rob.-Desv., Myod., 765. X. (1830)
Sitarea Rob.-Desv., Myod., 764. (1830).
Cerajocera, Rond., Dipterol. ital. Prodr., I. 111. 16. (1856).
Trypeta Lw., Trypetid., 51. XII. (1862).
Ceriocera, Rond., Dipterol. Ital. Prodr., VII. Tephrit. 31.X. (1870).

Distinguished by the wings which are usually without any markings and occasionally banded or spotted; by M cell which is always longer than the inferior angle of Cu cell and by the four scutellar bristles.

Head broader than high; frons broad, not prominent or very slightly so; face short, concave; cheeks fairly broad or narrow; epistoma more or less prominent; proboscis short not geniculate; palpi small, flat and bristly at end; vertex broad; antennae usually short, not reaching the epistoma, the third joint rounded beneath and gradually tapering to the tip, but it may be more elongated and in this case it is rounded at the apex; *s.or.*2, *i.or.*3 or 2; *oc.* strong; *pvt.* parallel or diverging; *ocp.* and genal bristle well developed.

Thorax with a complete chaetotaxy; *dc.*2 to 4; 2 to 1 strong *mpl.; scp.* present or obsolete; scutellum with 4 bristles. Abdomen elongated, convex, with lateral and apical bristles which are usually short; female ovipositor corneous, flattened and usually rather long.

Wings comparatively small, almost always entirely hyaline (in the species here described), sometimes clouded with white or opaque, sometimes they may be with transverse bands; all the veins are usually straight; R2+3 and R4+5 nearly always parallel at the apex and the latter always bare; radio-median cross-vein placed after or at the middle of 1st M2 cell; inferior angle of Cu cell drawn out into a short but pointed angle which is shorter than M cell; costal bristle weak to well developed.

TYPE : *Musca serratulae* Linnaeus (1758).

This genus is now taken by Bezzi and Hendel in the sense of

Trypeta Loew and other authors with the addition of *Sitarea*, which, according to Robineau-Desvoidy contained the species with banded wings. It is one of the largest of the family and contains over 45 species from the Palaearctic Region and is also represented in the Ethiopian and Indo-Australian Regions.

The life-history of some species are known. The larva of *T. virens* Lw. in Europe feeds on the essential organs of the flowers of *Centaurea paniculata*, while in Egypt *T. jacea*, Rob.-Desv. lives in the larval stage in the flowers of *Centaurea aegyptiaca*, and *T. planiscutellata*, Beck., in the inflorescence of *Pluchea dioscoridis*. Frauenfeld has bred, *T. serratulae L.* in Europe from the inflorescence of *Carduus defloratus* and *C. acanthoides*.

TABLE OF EGYPTIAN SPECIES

1 (6) *dc.* normal, 2; wings without bands or markings.

2 (5) scutellum yellow; wings hyaline; 2 *s.or.* black.

3 (4) Abdomen yellow with black spots; ovipositor short .... 1 **T. serratulae,** L.

4 (3) Abdomen entirely yellow ; ovipositor long and corneous .... 2 **T. virens,** Lw.

5 (2) Scutellum grey, only at the tip yellowish; wings milky white; upper *s.or.* short, white .... 3 **T. planiscutellata,** Beck.

6 (1) *dc.* 4; wings with transverse yellow bands .... 4 **T. jaccae,** Rob.-Desv.

TERELLIA SERRATULAE, Linneaus
(Pl. III fig. 3 and Pl. I fig. 17)

L., Syst. Nat., X.1.600.90 (*Musca*) (1758), Faun. Suec., II. 461.1871 (*Trypeta*) (1761) et Syst. Nat., XII. 997.118 (*Musca*) (1766); Fabr., Spec. ins., II.453.96. (*Musca*) (1781), Entom. syst., IV.356.182. (*Musca*) (1794) et Syst. Antl., 278.27. (*Dacus*) (1805);

Fall., Dipt. Suec. Ortalid., 14.22. (*Tephritis*) (1820); Walk., Entom. Mag., III.62.f.1 (1836) et Inst. Brit., II.201.7. (*Trypeta*) (1853); Lw., Germ. Zeitschr., V.419.t.II.f.70. (*Trypeta*) (1844), Linn. entom., I.522.75. (*Trypeta*) (1846) et Trypetid., 62.15.t.X. f.1. (*Trypeta*) (1862); Zett., Dipt. Scand., VI.2256.52. (*Tephritis*) (1847); Frfld., Verh. zool.-bot. Ges. Wien, XIII.216. (*Trypeta*) (1863); Schin., Faun. Austr., II.134. (*Trypeta*) (1864); Rond., Dipterol. Ital. Prodr., VII. Tephrit. 44.18 (1870); Walk., The Entom., No. 92.345.88. (*Trypeta*) (1871); Kaltenb., Pflanzenf., 265.10. et 379.54. (*Trypeta*) (1872); Bez., Dipt. Syr. et Aegypt., 63.141. (1909).

luteola Rob.-Desv., Myod., 759.2. (*Tephritis*) (1830); ? Wied., Aussereurop. Zweifl. Ins., II.491.22. (*Trypeta*) (1830).

pallens Wied., Analect. entom., 54.120. (*Trypeta*) (1824) et Aussereurop. Zweifl., Ins., II.502.40. (*Trypeta*) (1830); Meig., Syst. Beschreib., V.347.t.L.f.5. (*Trypeta*) (1826).

palpata Rob.-Desv., Myod., 759.1. (1830).

DIAGNOSIS:— A small yellowish-brown species, easily distinguished by its entirely hyaline wings, its yellow abdomen which possesses irregular black spots on the upper margins of the segments and by the short female ovipositor.

Male and *Female*. Length of body : 4.8 mm.; ovipositor (after Loew) : 0.8 mm.; wing : 4 mm.

DESCRIPTION:— Frons yellowish-brown but becoming gradually paler below and on the sides where it is pale yellow, almost whitish; this pale colour extends on the two basal segments of the antennae, face, cheeks and lower half of the occiput; epistoma faintly edged with yellow at the base, but darker towards the tip where it is brownish; it possesses a few pale erect hairs; palpi pale yellow but reddish-yellow at the tip; occiput dark yellowish-brown on its upper half, which colour extends on the vertex; vertical triangle black; antennae with the third joint less than twice the length of the second, gradually tapering to the tip but not pointed and entirely reddish-yellow; arista delicately pubescent, blackish except on its basal third pale yellow. The pubescence on the sides of the frons is delicate, inconspicuous and whitish, but much longer and bristly on the occiput and blackish on the jaws; 2 strong *s.or.*; *pvt.* parallel; all the bristles are black except the *vt.* brown and the *pvt.* and *ocp.* yellowish.

Thorax elongated, quadrate, black on the disc except on the lower and lateral margins and almost all the pleurae where it is from pale to dark yellow, the humeri are pale yellow, which colour extends longitudinally in an even line along the upper margins of

the pleurae to the wing base; the pteropleurae are yellowish brown as well as the mesopleurae but this latter possesses a large elongated pale yellow spot in the centre; the sternopleurae are pale yellow on the upper third and blackish below and the mesophragma is also blackish; scutellum entirely yellow but darker at the base owing to its being rather transparent; *dc.*2; *mpl.*2 strong; all the bristles are blackish; the thorax is entirely covered with a delicate whitish grey dust. The pubescence on the disc is rather dense, short and pale.

Abdomen yellow to brownish-yellow with black rounded markings, three in the apical half of the first and three in the basal halves of each of the second, third and fourth segments; the markings in the fourth segment however are longer, triangular and this segment is rather pointed at the tip; the pubescence is very similar to that of the thorax and with some short lateral and apical bristles; male hypopygium yellow, fairly large, globular and possessing some erect black hairs; female ovipositor according to Loew and Schiner is short, being shorter than the three last abdominal segments together.

Legs entirely yellow with the front femora possessing a well developed row of bristles beneath and the middle tibiae bearing a single spur; pubescence uniformly blackish all over.

Wings entirely hyaline and somewhat greyish with the veins dark brown and much paler towards the base; stigma brownish-yellow; costal bristle double but weak; radio-median cross-vein perpendicular, placed well after the middle of 1st M2 cell and immediately after the tip of R1.

Squamulae whitish; halteres pale yellow.

I have not yet seen a specimen of this species from Egypt and I believe it has never been recorded again from here since its first record by Wiedemann in 1830 (his *Trypeta luteola* being almost certainly a synonym of this species). The above description is made from one male from Italy kindly sent me by Professor Bezzi and two other males from Austria given me by Dr. Czerny of Vienna.

TERELLIA VIRENS Loew.
(Pl. III fig. 7 and Pl. I fig 19)

Lw., Linn. entom. 1.523. (*Trypeta*) (1846) et Trypetid., 63.17. (*Trypeta*) (1862); Frfld., Sitzungsber. d. K. Akad. d. Wiss., XXII.554. (*Trypeta*) (1856); Schin., Faun. Austr., II.134. (*Trypeta*) (1864); Rond., Dipterol. Ital. Prodr., VII. Tephrit. 45.29 (1870); Kaltenb., Pflanzenf., 387.58. (*Trypeta*) (1872).

DIAGNOSIS:— A comparatively large yellow species (yellow-

ish-green when alive) which possesses a black and yellow thorax, a yellow abdomen, hyaline wings and a long corneous female ovipositor.

Male and *Female.* Length of body : 6.3 mm.; ovipositor : 1.9–2.2 mm.; wing : 4.8 mm.

DESCRIPTION:—Head very broad, entirely yellow, except the face (which is slightly concave) much paler owing to a whitish pulverulence, and the vertical triangle black; antennae pale yellow and possessing a very delicate and minute, pale pubescence, with the third joint fairly broad and rounded at the tip; arista microscopically pubescent, blackish except on its basal third yellow; the first and second antennal joints possess some short black bristles; the pubescence is short and brownish on the sides of the frons, longer and decidedly bristly on the cheeks and jaws and on the occiput yellowish; in addition the vertical triangle possesses a few blackish erect hairs; palpi with black bristles on the apical half; *s.or.*2, strong; *pvt.* parallel; all the bristles are black except the *prt.* and the *ocp.* yellowish.

Thorax blackish on most of the disc but yellow on the margins and pleurae; the black markings on the disc are very characteristic; on the upper margin the black starts as a broad but short median stripe, which widens laterally till just before the humeri, and extends down to the suture, where it continues downwards in a stripe covering the median third of the disc and finishing at about two thirds the lengths of the disc; on each side of this stripe there are two elongated black stripes, gradually tapering at both ends, their upper ends running into the black of the disc at the suture, and their lower margins ending at a small distance from the apex of the disc; these two lateral stripes are separated inwardly in their upper halves from the median black stripe by a thin yellow line; in addition there are two small black rounded spots in a straight line with the tip of the two black lateral stripes, from which arise the *prsc.;* in other words the disc is black except the lateral margins above the suture yellow and below the suture broadly yellow, as well as the lower margin and the basal median third yellow; the whole of the disc and pleurae are covered with a very fine whitish dust; the pubescence on the disc is fairly dense and pale yellowish; scutellum entirely yellow and possessing four bristles; mesophragma shining black; 1 strong *mpl.;* the pleurae are yellow except for an elongated, emarginate oblique spot continuing down from the mesophragma, a small rounded spot on the lower margin below the posterior stigma and between the middle and hind coxae shining black, in addition there is a large black and shining spot behind the wing base and immediately below the 2 *p.sa.*

Abdomen fairly broad, entirely yellow to brownish-yellow and possessing an erect blackish pubescence except on the upper half and lateral sides of the basal segment; on the lateral margins of the three last segments and at the apex there are some fairly long black bristles; male hypopygium small, oval, reddish to brownish-yellow and bearing some brown bristly hairs; female ovipositor yellow, elongated, being almost as long as the abdomen, corneous and flattened; its pubescence is similar to that of the abdomen, except on the apical third where it is scarcer and less conspicuous.

Legs entirely yellow with the front femora bearing each one row of strong bristles and two rows of shorter bristles on the outside; the hind femora possess, each, three bristles near the apex. above; the pubescence is uniformly blackish all over.

Wings entirely hyaline with the stigma and all the veins yellow; costal bristle double but weak; radio-median cross-vein rather oblique and placed after the middle of 1st M2 cell.

Squamulae whitish; halteres yellow.

The above description does not seem to correspond with that of Loew and Schiner as regards the colour of the abdomen; they both describe it as "yellow with four rows of rather small black spots and which, occasionally in the male are distinct only on the last segment, in addition to which there is a small black and distinct spot in each posterior corner of the same segment." In a series of more than twenty specimens from Egypt I cannot find any trace of these abdominal spots, consequently I am led to believe that the entirely uniform colour of the abdomen is due to a local variation.

T. virens is of a beautiful yellow-green colour and with metallic bluish-green eyes when alive, which colour disappears after death and the specimens remain of a dull greyish-yellow colour with a very faint greenish tinge.

This species has been bred in Europe from the inflorescence of *Centaurea paniculata* by Frauenfeld. In Egypt it is not common — I have found it so far only in Marg, Wadi Hoff and in our garden at Shoubra and my dates extend from March 12th to June 7th 1922. *T. virens* has been recorded in Italy, Spain, Germany and Egypt.

TERELLIA PLANISCUTELLATA Becker.
(Pl. II fig. 4)

Beck., Mitteil. Zool. Mus. Berlin, II.136.220. (*Trypeta*) (1903)

DIAGNOSIS:— A small entirely grey species with somewhat opaque wings and with the upper *s.or.* small and white.

Male and *Female.* Length of body : 3.2—3.5 mm.; ovipositor : 0.5 mm.; wing : 2.8 mm.

DESCRIPTION:— Head yellow and entirely covered with a pale grey tomentum which is somewhat whitish and denser on the face; epistoma but little prominent; proboscis and palpi very short, pale yellow and possessing some small blackish bristly hairs; eyes large, rounded; antennae yellow with the third joint twice as long as broad, a little concave above and pointed at the tip; arista blackish but yellow at the base; the pubescence is very inconspicuous, scarce and yellowish; all the bristles are shining yellowish-brown except the upper *s.or.*, the parallel *pvt.;* the outer *vt* and the *ocp.* white.

Thorax and scutellum entirely covered with a dense cinereous tomentum, but the blackish ground colour of the disc shows in certain lights; scutellum very flat and yellow at the tip by transparency; mesophragma blackish but also covered with a dense grey dust; all the bristles are shining yellowish-brown, appearing somewhat pale and transparent in certain lights except the *p. npl.* and the *st.* white; the *mpl.* and the *st.* are accompanied by some white bristly hairs; all the bristles on the disc and scutellum are inserted on small blackish dots; the pubescence on the disc is short but rather dense, adpressed and very pale yellowish.

Abdomen short and broad, entirely yellowish except for a blackish, often inconspicuous median longitudinal line; sometimes this dark colour extends laterally, especially on the basal segment and on the fourth and fifth segments; all the segments are entirely covered with a cinereous dust; the pubescence is rather dense, very pale yellowish and is longer and bristly on the lower margins of the segments, especially at the apex; ovipositor very short, being a little longer than the fifth segment, flat, conical and reddish-yellow; the extreme tip of its basal segment is usually blackish.

Legs entirely yellow with a minute blackish pubescence.

Wings of a characteristic milky white colour and somewhat opaque, with the stigma and all the veins yellow; median and radio-median cross-veins very approximate, the distance between them being not more than the length of the latter; inferior angle of Cu cell drawn out into a short, broad point, shorter than the M. cell; costal bristle weak.

Squamulae whitish; halteres yellow.

This species was originally found by Becker in the desert near Siala (Fayoum) on the Composite plant *Pluchea* (*Conyza*) *dioscoridis* in March (together with the curious *Schistopterum moebiusi* Beck.).

T. planiscutellata is common wherever its widely distributed host plant grows and I have bred it from the inflorescence of the

above mentioned plant from flower heads collected in Ghezireh, Maadi, Barrage and Alexandria. It seems to live in company with *S. moebiusi* Beck. (in the larval stage) as in all the above mentioned cases both species were bred tgoether. My dates extend from February to November 1923 but in all probability they could be found and bred the whole year round.

TERELLIA JACEAE ROBINEAU-DESVOIDY.
(Pl. III fig. 6).

ROB.-DESV., Myod., 766.I. (*Tephritis*) (1830); DUF., Ann. Soc. entom. Fr., 48. (*Trypeta*) (1857); LW., Trypetid., 52.I.t.VII.f.1. (*Trypeta*) (1862); FRFLD., Verh. zool.-bot Ges. Wien, XIII. 215. (*Trypeta*) (1863); SCHIN., Faun. Austr., II.126. (*Trypeta*) (1864); ROND., Dipterol. Ital. Prodr., VII. Tephrit 38.6. (1870); KALTENB., Pflanzenf., 387.59. (*Trypeta*) (1872).

arctii MEIG., System. Beschr., V.317.10.t.XLVIII. f.28. (*Trypeta*) (1826) ; MACQ., Suit. à Buff., II.467.25. (*Tephritis*) (1835); BECK., Zeitschr.f. Hymenopt. u. Dipt., II.236.10. (*Trypeta*) (1902).

dorsalis ROB.-DESV., Myod., 766.2. (*Tephritis*) (1830).

punctata LW., Germ. Zeitschr., V.328.t.I.f.9. (*Trypeta*) (1844); ZETT., Dipt. Scand., VI.2186.12. (*Tephritis*) (1847).

pusilla ROB.-DESV., Myod., 766.3. (*Tephritis*) (1830).

DIAGNOSIS:— A handsome yellow species with banded wings and immediately distinguished by the 4 *dc.* and by the inferior angle of Cu cell which is drawn out into a very long and pointed angle.

Male and *Female*. Length of body : 3.8—4.5 mm., ovipositor : 1.3 mm.; wing : 3.4—4.2 mm.

DESCRIPTION:— Head entirely reddish-yellow except the face and antennae pale yellow and the ocellar triangle blackish; cheeks fairly broad; there are some minute black hairs on the lateral margins of the frons and some much longer ones on the cheeks; the occiput, which is convex, also possesses some pale yellow hairs; antennae rather elongated with the third joint rounded at the tip; arista blackish but reddish-yellow at the base; all the bristles are black except the *prt.* and the genal bristle pale yellowish.

Thorax reddish-yellow with eight shining black rounded spots on the disc, from which arise the *prst.*, the *a. npl.* and the four cha-

racteristic *dc.*; in addition there is a small black spot immediately above the wing base; pleurae entirely pale yellow; all the bristles are black and the *mpl.* is accompanied by some pale bristly hairs; the pubescence on the disc is pale yellow and consists of rather thick but short hairs; scutellum yellow with three characteristic black spots, one on each side of the base and one at the apex.

Abdomen reddish to brownish-yellow with four transverse rows of black rounded spots, each row consisting of five spots and situated at the upper margin of each abdominal segment; two of these rows are situated one on each side of the lateral margins and the two others one on each side of the central line; ovipositor reddish-yellow, flattened and about as long as the three apical segments together.

Legs entirely yellow; front femora with a row of bristles beneath; middle tibiae with a single spur; hind tibiae with a row of much weaker bristles on the outer side.

Wings hyaline with four transverse yellow bands, which are united at the upper margin and appearing somewhat as deep indentations; the first band covers the base of the wing and extends downwards covering the M cell, (except for one hyaline spot always present in this cell) Cu cell and Cu2+A2 but not quite reaching the lower margin, and leaving the allula hyaline; the second band is situated below R1, covering the radio-median cross-vein and reaching to the lower margin; the third band is parallel with the second, covering the median cross-vein and also reaching to the lower margin; the fourth band is usually much darker in colour, oblique and covers the apices of R4+5 and M1; the margins of these bands or indentations are bordered with brown; the union of these yellow bands on the upper margin entirely covers the costal cells, the *sc.* cell, the stigma, R1 cell and almost all R3 cell; the basal half of the stigma however is lighter than the apical half and there are usually two small, pale hyaline spots in R1, touching the costa, the first of which is situated immediately after the stigma and the second above the median cross-vein; costal bristle double; R2+3 and R4+5 undulated and not parallel; radio-median cross-vein placed at the middle of 1st M2 cell; inferior angle of Cu cell drawn into a long and pointed angle but shorter than M. cell.

T. jaceae is quite common in Egypt especially in localities where its food plant, *Centaurea pallescens* grows.

Frauenfeld in 1862 had bred one specimen in Europe from the head of *Centaurea scabiosa*. I have captured this species commonly in the Mariout district, Cairo and its neighbourhoods, Alexandria and in the Wadi Hoff. I have also seen specimens from Mazghouna

and Sakkara and in all probability the bionomics of this fly in Egypt is not confined to the above species of *Centaurea* only. My records date from April to June 1922.

T. jaceae is also known from Europe; Spain and Persia.

I have recently bred this species, together with *Trypanea amoena* Frfld. from the capitulum of *Centaurea calcitrapa* from the Barrage (10.VI.1924).

12. SPHENELLA, Robineau-Desvoidy.

Rob.-Desv., Myod., 773 (1830).

Distinguished by the fairly long and geniculate proboscis, the prominent epistoma, the 4 scutellar bristles, and the banded wings with very approximate cross-veins.

Head broader than high; frons prominent, fairly long, broad and depressed; face short and concave; eyes small, fairly rounded, cheeks not broad; epistoma prominent; proboscis long, geniculate; palpi small with a few scarce bristles; antennae inserted below the middle of the eyes, with the tip of the third joint reaching the epistoma, less than twice the length of the second joint and a little pointed at the upper corner; arista microscopically pubescent; *oc.* strong, *s.or.*2, the upper white and short, the lower black, *i.or.* 2; *vt.* one black and long, the other white, short and very straight; *pvt.* divergent; *ocp.* strong, whitish; genal bristle not strong.

Thorax with a complete chaetotaxy, but the *scp.* very weak, almost obsolete; only one strong black *mpl.;* scutellum flat with 4 bristles of almost equal size, the apical pair diverging at the apex. Abdomen with apical and lateral bristles; ovipositor short and flattened.

Legs short and strong; front femora with rows of bristles above and beneath; middle tibiae with a single spur; hind tibiae with some short hairs in addition to the usual fine pubescence.

Wings narrow, elongated, with a very characteristic pattern which consists of a complete cross-band after the middle, as well as spots; costal bristle small; R1 short, ending well before the radio-median cross-vein ; R2+3, R4+5 and M1 parallel ; R4+5 bare ; radio-median and median cross-vein very approximate, the distance between them being less than the length of the former; inferior angle of Cu cell drawn out into a short and broad point, as long as the median cell.

Only one species is known so far in the Palearctic Region which seems to have a very wide distribution in Europe, Asia Minor and North Africa. The larva is known to breed in Europe in almost all the species of plants of the genus *Senecio*, as well as in *Centaurea*, and *Cineraria* sp.

TYPE : *Sphenella marginata* Fallen (1820).

SPHENELLA MARGINATA, Fallen.
(Pl. IV fig. 3 and Pl. 1 figs 8 and 12)

Fall., Dipt. Suec. Ortalid., 7.8. (*Tephritis*) (1820); Meig., Syst. Beschr., V. 323. t. XLIX. f. 15 (*Trypeta*) (1826); Walk., Entom. Mag., III. 73. f. 18 (1836); Macq., Suit. à Buff., II. 465, 18 (*Tephritis*) (1835); Lw. Germ. Zeitschr., V. 344. t. I. f. 17 (*Trypeta*) (1844) et Linn. entom., I. 499. 20. (1846); Zett., Dipt. Scand., VI. 2190. 15 (*Tephritis*) (1847); Scholtz, Zeitschr. f. Entom. Breslau, 13. (1848); Walk, Ins. Britann., II. 202. 10. (*Trypeta*) (1853); Frfld., Sitzungsber. d. K. Akad. d. Wiss., XXII. 539. (1859); Schin., Verh. zool.-bot. Ges Wien, VIII. 667. 59. (1858); Lw.; Trypetid., 76. 1. t. XIII. f. 5. (1862); Schin., Faun Austr. II. 152. (*Tephritis*) (1864); Kaltenb., Pflanzenf., 364. 31 et 387. 56 (*Trypeta*) (1872); Beck., Zeitschr. f. Hymen. u. Dipt. 5. 391. 425 (1907) et Mitteil. Zool. Mus. Berlin, IV. 139. 403. (1908); Hend., Wien. Entom. Zeitg., XXXIII. III. u. IV. 94 (1914).

arcuata Schrank, Fauna Boica, III. 142. 2508 (*Trupanea*) (1803); Rond., Dipterol. Ital. Prodr., VII. 47. I. (*Tephritis*) (1870).

linariae Rob.-Desv., Myod., 774. 1. (1830)

DIAGNOSIS:— A small, brownish-grey species, easily distinguished by the characteristic pattern of the wings, which consists of a complete cross-band after the middle, as well as spots and by the very approximate cross-veins.

Male and *Female*. Length of body : 1.5 mm.; ovipositor : 0.7 mm.; wing : 4 mm.

DESCRIPTION:— Frons yellow, but whitish near the eye margins and continuing so to the cheeks; face yellow in the centre but whitish on the sides; face, frons and cheeks with some small whitish hairs; epistoma shining yellow; proboscis and palpi yellow; occiput pale yellow, but blackish towards the centre and bearing some whitish bristly hairs, especially below and on the sides; vertex greyish-yellow with the vertical triangle blackish; antennae pale reddish-yellow and entirely covered with a very minute white pubescence, arista black for a little more than its apical half, reddish-yellow below; all the bristles are black except the posterior *s.or.*, the smaller *vt.*, the *ocp.* and the genal bristle whitish.

Thorax black and entirely covered with a fine, dense pulverulence which is tawny on the disc and grey on the pleurae; in addition it bears a pale yellow pubescence composed of short, thick and rather blunt hairs, which is fairly dense and even on the disc, but scarcer, unevenly scattered and much longer on the pleurae; in fact

the seven or eight hairs on the pteropleurae are decidedly bristly; scutellum tawny-yellow and bearing a very fine pulverulence of the same colour; *a.sc.* convergent and crossed at the apex; all the bristles are black except the *pt.* pale yellow.

Abdomen entirely black and covered with a very fine and thin grey pulverulence which is tawny on the extreme apical margins of the first four segments and on the apical third of the fifth segment; the pubescence is very similar to that of the thorax, but with a few longer hairs on the lower and lateral margins and, in addition, with a few small black bristles on the lower margin of the fifth segment; the short and flat ovipositor is shining black, the pubescence on its basal half being similar to that of the thorax and abdomen, but on its apical half much finer and blackish.

Legs entirely rusty-yellow with the usual black pubescence; the front femora possess three rows of small bristles on the outer margin and below, two of which are usually black and the third row pale-yellowish; in addition, on the hind femora, there is one very short black bristle on the outer margin near the apex.

Wings hyaline, but yellowish at the base, with one complete transverse dark brown band and three or four spots on the upper half; the cross-band is situated immediately after the middle and extends from the costa to the base, covering the radio-median and median cross-veins, to the lower margin; sometimes there are some paler rounded spots in this dark band, especially in its upper half; the dark brown spots are: one on the stigma, variable and usually extending from the costa over the 2nd costal cell to the base of R2+3 and R4+5; this spot is the palest, least conspicuous and is much darker below than above; one covering the whole of the stigma and extending downwards almost touching R2+3, usually this spot is interrupted in the centre by a paler spot and its outer corner is very often connected with the top of the cross band; finally one large spot on the apex of the wing, covering the apices of R2+3, R4+5 and M1; this spot is extremely variable in shape, usually its lower margin is very emarginate, especially in the centre and with a small rounded hyaline spot below the extreme tip of R2+3; sometimes it is completely interrupted in the centre (i.e. the deep hyaline emargination of the lower margin meeting the round hyaline spot below the apex of R2+3) and thus giving the appearance of two distinct spots; in addition there are three small, indistinct, pale brownish spots, two on the lower side of and touching M3+Cu1 and one immediately below Cu2+2nd A; all the veins are yellow, but blackish in correspondance with the dark spots and band; costal bristle small but distinct.

Squamulae and halteres yellow.

S. marginata, although not common, seems to be widely distributed in Egypt. I have captured it in Cairo and neighbourhoods (Marg, Kerdacé, Maadi, Abou-Zaabal) and in the Mariout district; my dates extend from February 10th to March 15th. The food plant in Egypt is not known but I suspect it to breed in the capitulum of *Senecio sp.* and in *Centaurea alexandrina* Del. This species has a very wide geographical distribution; it is recorded from Spain, Dalmatia, Asia Minor, Madeira Island, Canary Islands and North Africa.

NOTE. — I have bred recently *S. marginata* from the capitulum of *Senecio coronopifolius* and *Picris sprengeriana* from Kerdacé. The inflorescence was brought in the laboratory on 21.IV.1924 and three specimens 2 ♂ ♂ and 1 ♀ emerged 3.V.1924 and 3 ♂ ♂ and 2 ♀ ♀ 8.V.1924.

13. ENSINA, Robineau-Desvoidy.

Rob.-Desv., Myod., 751 (1830).

Allied to *Tephritis*, but distinguished from it and from other genera by the very characteristic shape of the head and by the narrow elongate wings which usually possess a reticulate pattern.

Head very depressed, i.e. broader than high and as deep as broad; frons narrow, longer than broad; face short and concave; eyes fairly rounded; cheeks very narrow; epistoma prominent; proboscis long, geniculate; palpi elongate, narrow with a few bristles at the end; occiput usually swollen below; antennae inserted below the middle of the eyes, reaching the epistoma, the third joint twice the length of the second and a little pointed at the upper corner, arista at most microscopically pubescent; *s.or.* 1 or 2, *i.or.* 2 or 3; *oc.* strong; *pvt.* parallel; genal bristle weak; *ocp.* well developed.

Thorax with pale pubescence and a complete chaetotaxy; only 1 strong *mpl.*; scutellar bristles 2 or 4.

Abdomen slender with paler pubescence and possessing lateral and terminal bristles; male hypopygium small and rounded; female ovipositor fairly short, flattened.

Wings narrow and elongate with a small costal bristle; R1 not reaching the radio-median cross-veins; all the veins are straight but no two are parallel; inferior angle of Cu cell very short but pointed; wing pattern reticulate, the reticulation being sometimes little developed.

TYPE : *Musca sonchi* Linnaeus (1766)

Hendel has pointed out the necessity for the extension of the present genus to embrace other species besides the typical *sonchi*. Owing to the fact that the prolongation of the proboscis is very variable in the different species, Bezzi has suggested that the genus should be restricted to those species in which the form of the head has the very characteristic shape which may be seen in *sonchi* and *sororcula;* however he further provisionally admits in the genus some African species in which the head is less or not at all depressed and which possess a very long proboscis.

The members of this genus usually pass their larval stage, in the floral buds of *Compositae*. Frauenfeld has bred the

european *E. sonchi* L. from the flower-heads of the following *Compositae : Sonchus oleraceus, S. arvensis, Leontodon autumnale, L. hastile, Tragopogon pratensis, Homogyne alpina, Scorzonera (Podospermum) jacquinii, Carduus nutans* and *Crepis spp.* Only one species is so far known from Egypt, *E. sororcula*, Wied., which has a very wide geographical distribution, being known in India, Teneriffe, Madeira Island and North Africa up to Erythrea.

ENSINA SORORCULA, Wiedemann.
(Pl. IV fig. 6 and Pl. I fig. 13)

Wied., Aussereurop. Zweifl. Ins., II. 509.52 (*Trypeta*); Czerny, Wien. Entom. Zeitg., XXI. 256 (*Oxyna*) et XXV. 254 f. 1-2 (*id.*) (1906); Beck., Mitteil. Zool. Mus. Berlin, IV. 144. 420 (*Oxyna*) (1908); Bez., Mem. Indian Mus , III. 3. 159 (*Oxyna*) (1913).

vacillans, Wollast., Ann. Mag Nat. Hist., (3) I. 115. (1858).

variipennis v.d. Wulp, Termesz. Fuzet., XX. 143.28. pl. III. f. 3-4 (*Leptomyza*) (1897).

bisetosa (male) Enderlein. (1911).

DIAGNOSIS:— A small, almost entirely grey species, distinguished by its rather slim and elongate body and wings and by its reticulate wing pattern which can vary from being dark to very light.

Male and *Female.* Length of body : 3 mm.; ovipositor : 0.8 mm.; wing : 2.6 mm.

DESCRIPTION:— Head entirely yellow but whitish towards the centre of the frons (immediately below the ocellar triangle), on the eye margins and on the face, epistoma, cheeks and occiput owing to a very fine white pulverulence; occiput swollen below; vertex yellow, but black on the ocellar triangle; antennae yellow with a very minute pale pubescence; arista dark brown and microscopically pubescent; *s.or.* 2, *i.or.* 2; all the bristles are black except the upper *s.or.*, the shorter *vt.*, the *pvt.* and the genal bristle whitish.

Thorax and scutellum blackish but entirely covered with a dense brownish or yellowish-grey pulverulence and with the three darker longitudinal lines on the disc very inconspicuous; on the pleurae the pulverulence is much lighter in colour, almost whitish, especially below; the pubescence on the disc is very pale yellowish, fairly coarse and adpressed; all the bristles are black except the *scp.* light greyish-yellow and the *pt.* pale yellow; scutellum small with only two *b.sc.* and very rarely two very small but distinct *a.sc.* are present.

Abdomen elongated, convex, somewhat narrowed at the base, blackish and entirely covered with a dense brownish-grey pulverulence like the thorax, except on three or four pairs of more or less distinct darker spots, two on each of the first, second, third and sometimes the fourth segments respectively; the pubescence is pale yellowish, less adpressed than on the thorax and longer on the lower margins of the segments; in addition there are a few rather short black bristles on the apices of the third and fourth segments; male hypopygium small, blackish; female ovipositor very shining black, and as long as the third, fourth and fifth segments together; it is fairly broad and flattened on its basal two thirds but narrow and cylindrical on its apical third and possesses a very delicate, short and blackish pubescence.

Legs dark yellow except the femora which are blackish on their basal two thirds and sometimes the front or middle femora only are blackish on their basal two thirds below, with the middle and hind or the front and hind femora black except the apical third yellow; the row of bristles on the lower side of the front femora is blackish and weak and usually there are from one to four short bristles on the upper side of the hind femora near the tip; the pubescence on the legs is blackish and short.

Wings elongated and narrow, hyaline with a brownish diffuse reticulation which varies in distinctness; the most conspicuous spots are on the upper wing margin, composed of one blackish spot covering the stigma, one smaller and paler just after the middle, one much larger, elongated, which covers the apex of R2+3 and usually going below R4+5 and one quadrate or triangular spot at the tip of the wing, covering the apex of R4+5; the rest of the spots in the centre and lower half of the wing are very diffuse and faint; all the veins are yellow but blackish or dark brown in correspondance with the brownish spots; costal bristle weak but distinct.

Squamulae whitish; halteres yellow.

E. sororcula is very common througout Egypt and may be found almost the whole year round; my dates extend from April to November. I have captured it in Cairo and environs, Helwan, Fayum, Alexandria and in the Mariout district. The food plant in Egypt is unknown. This species has a wide geographical distribution being known from the Canary Islands (Teneriffe), Madeira Island and Erythrea.

14. SPATHULINA, RONDANI.

RONDANI, Dipterol. Ital. Prodr., 1.113. (1856).

Distinguished by the black wings which possess a few hyaline spots, the short geniculate proboscis, the strong *oc.* and *ocp.* and the absence of the *a. sc.*

Head broader than high; eyes rounded; frons much broader and longer than the face; epistoma but little prominent; proboscis short but geniculate, palpi small; cheeks broad; antennae placed at or immediately below the middle of the eyes, short, with the third joint about twice the length of the second, not pointed and the second joint with a little prominence above; arista delicately pubescent; cephalic chaetotaxy strong, complete; *oc* very strong; *s.or.*2, weaker than the 2 *i.or.*; *prt.* diverging; inner *vt.* very long and strong; *ocp.* well developed; genal bristle not strong; all the bristles are black except the upper *s.or.*, the *prt.*, the outer *vt.*, the *ocp.* and the genal bristle yellowish.

Thorax with a complete chaetotaxy and the dorsal bristles inserted on minute black dots; scutellum with only one pair of *b.sc.*

Abdomen black, devoid of pollen and with bristles; female ovipositor not long, flattened and conical.

Legs fairly strong; front femora with a row of bristles beneath; middle tibiae with a single spur.

Wings narrow and rather elongated with a strong or even double costal bristle, black with some hyaline spots; R1 short, ending before the radio-median cross-vein; R2+3, R4+5 and M1 almost straight and parallel; R4+5 bare; cross-veins not parallel; inferior angle of Cu cell drawn out into a short and broad point, as long as the M cell.

TYPE : *Tephritis tristis* LOEW (1869).

This old genus has been adopted in recent years by Bezzi for several species which fall under a natural group, characterised by the black abdomen, the black wings which possess only a few hyaline spots and the absence of the apical scutellar bristles. Bezzi had previously called this group *Melanoxyna*, but Rondani's name *Spathulina* (with the type species *S. sicula*, which is merely a synonym of *T. tristis* Lw.) was found quite applicable to it.

The species of this genus are not numerous; only two so far are known from the Palaearctic Region, the type *S. tristis* Lw. (=*sicula* Rond.) and our Egyptian *S. parceguttata* Beck.; the remainder are from the Ethiopian and Oriental Regions.

SPATHULINA PARCEGUTTATA Becker.
(Pl. IV fig. 5)

Beck., Mitteil. Zool. Mus. Berlin, II 134. T. 4d, f. 48 (*Oxyna*) (1903); Bez., Bull. Entom. Research, IX. I. 29 (1918).

DIAGNOSIS:— A small pretty species, distinguished by the wings which are black with their basal fourth hyaline and with some hyaline spots on the black area; the absence of the *a. sc.*; the black abdomen, and flat, shining black ovipositor.

Male and *Female.* Length of body 3–3.4 mm.; ovipositor : 0.8 mm.; wing : 2.7–3 mm.

DESCRIPTION:— Head entirely reddish-yellow with a very delicate white tomentum on the lateral margins of the frons, which extends downwards covering the face and cheeks; antennae reddish-yellow, with the second joint bearing some minute blackish bristly hairs; arista dark brown except at the base which is reddish-yellow.

Thorax and scutellum black, with a dense pulverulence, which is yellowish on the disc and cinereous on the pleurae and mesophragma; the bristles are black except the *scp.*, the posterior *npl.* and the *pt.* which are yellow; in addition these two latter are accompanied by some yellowish bristly hairs; the pubescence is yellow; scattered and adpressed but somewhat longer and erect on the anterior margin of the disc and paler on the pleurae, especially on the sternopleurae.

Abdomen entirely shining black with a faint greenish irridescence and with pubescence and bristles of the same colour. Female ovipositor flat, conical and shining black, of medium length, its basal segment being about equal to the length of the three apical segments of the abdomen together.

Legs entirely reddish-yellow. Squamulae whitish; halteres yellow.

Wings rather narrow and elongate, blackish-brown except the base which is hyaline to the middle of 2nd C cell, the bifurcation of R2+3 and R4+5 and two thirds of Cu cell; the blackish-brown area possesses some hyaline spots as follows : one immediately before the stigma, more or less large and rounded, running into a second smaller spot in the base of R1 cell; in this cell there are three other

spots touching the upper wing margin, the first is immediately after the stigma and touches the apex of the latter, the second is the largest and almost square in shape, runs into a much smaller spot in R3 cell, and the third is the smallest and situated in the apical third of R1 cell; these three spots are almost equidistant from each other; at the tip of R3 there is a second rounded spot; in the apical half of R cell there is a rounded spot which runs into a larger spot in 1st M2 cell; in R5 cell there are two spots, the first is the smallest, touches M1 and is situated above the median cross-vein; the second is at the extreme tip of the cell; the upper and outer margins of this spot touch R4+5 and the wing margin respectively but its lower margin does not quite touch M1; in the apical fourth of 1st M2 cell there is a second smaller spot; in 2nd M2 cell there are two elongated spots touching the lower margin of the wing but only the upper margin of the second spot touches M1; finally there are four spots in Cu1 cell, the two first of these are situated one above the other, the lower covering the tip of Cu2+2nd A, the third is the largest, touches the lower margin and the fourth very small, below the median cross-vein; all the veins are yellow at the base and on the hyaline spots, except the humeral cross-vein blackish; stigma entirely black.

Legs entirely reddish-yellow. Squamulae whitish; halteres yellow.

Only four specimens of this interesting species are known so far. Of these two males and one female were captured by Dr. Th. Becker in Cairo, in November 1898 and March1899. The remaining specimen is a male which was bred from flower-heads of *Ceruana pratensis* Forsk. collected on the West bank of the Rosetta branch of the Nile, North of the Delta Barrage (about 16 miles North of Cairo) by Mr. N. D. Simpson, on July 4th 1924.

NOTE : While this paper was in the press Professor Bezzi informed me that his *Spathulina parca* which is so widely spread in the Oriental Region, Australia and South Africa is only a variety of *parceguttata* Beck. In addition *Spath. acrosticta* Bezzi seems to be also a synonym of the same species.

It may also be useful to record that these three above mentioned names (*parceguttata* Beck., *parca* Bezzi and *acrosticta* Bezzi) will very probably eventually fall as synonyms of a species described by Schiner from Australia. Prof. Bezzi is working on this problem and will deal fully with it in an important work on the Diptera of the Fiji Islands which he is on the point of completing. In any case even if the synonymy of these three names is proved to be true they will always remain good to indicate varieties, as Schiner's species from Australia does not possess any isolated dark spots at the extremity of R4+5.

In South Africa the larva is known to live on Composites of the genus *Helichrysum*.

15. EUARESTA, Loew.

Lw., Monogr. Dipt. N. Amer. III. 296 (1873).

Allied to *Tephritis* and *Trypanea* but distinguished from them and from other genera, by the black pattern on the wings which covers more than half the surface, radiating at the apex and leaving the basal third of the wing entirely hyaline.

Head somewhat broader than high; eyes rounded; cheeks narrow; epistoma slightly prominent; proboscis very short; antennae placed below the middle of the eyes, with the third joint a little longer than broad and not pointed at the tip; arista usually bare; *oc.* well developed; *s.or.*2, the upper white and the lower black, *i.or.* 3 or 4; *prt.* white, parallel; *vt.* white; *ocp.* very well developed, white; genal bristle well developed.

Thorax with a complete chaetotaxy and always possessing a grey pulverulence and yellow pubescence; scutellum flat on the disc, with 2 *b.sc.*, but often the 2 *a.sc.* are also present.

Abdomen fairly broad, almost without bristles; ovipositor not long, flattened and conical.

Legs fairly short but strong; front femora with a row of bristles beneath; middle tibiae with a single spur.

Wings rounded elliptical, with more than half the entire surface black, the black pattern being on the apical two thirds of the wing, with only a few hyaline spots, and developing distinct rays at the apex; costal bristle small, double; R1 not reaching the radio-median cross-vein; R2+3, R4+5 and M1 not parallel; R4+5 bare; cross-veins parallel and perpendicular, fairly approximated; inferior angle of Cu cell ending in an extremely short and broad point, shorter than the M cell.

TYPE : *Trypeta festiva* Loew (1873).

This genus was erected by Loew for several species of *Trypeta*, in which the pattern of the wings forms distinctly developed rays at the apex, Hendel, however, and later Bezzi, have used it in a somewhat wider sense. As the characters shown in our fairly typical Egyptian species *iphionae*, mihi, agrees with Loew's interpretation of *Euresta*, I have provisionally placed it in this artificial genus. All the species of this genus pass their larval stage in the twigs of

various *Compositae*, where they form fairly large and conspicuous galls. The Sicilian *E. megacephala* Lw. is known to be galligenous on *Inula crithmoides. E.iphionae*, Efflat, is also well known here to form large galls in the composite plant,*Iphiona mucronata*,a species closely allied to the host plant of the European species. It is quite possible therefore that many other species will be found to belong to a natural genus which is biologically characterised by the faculty of producing galls or pleurocecidia on *Compositae*, a character quite uncommon in the group of flower-head flies.

The gall of *Iphiona mucronata* (Forskal) formed by the larva of *E. iphionae* Efflat. is an ovoid or fusiform swelling, measuring up to 8 mm. in diameter and 8 to 15 mm. in length Those situated in the centre of the large branches are fusiform, but the ones occupying the whole of the surface of the smaller branches are ovoid and truncated above; the central cavity of the gall is large with a wall 1.5 mm. thick. The adult escapes by means of a hole which it perforates at the side.

EUARESTA IPHIONAE Efflat.
(Pl. V fig. 8 and Pl. I figs 1 and 21)

Efflat., Bull. Soc. Roy. Entom. d'Egypte, 153. (1923).

DIAGNOSIS:— A beautiful bright green species when alive; greenish-grey when dry; easily distinguished by the pattern of the wings, which have their basal third hyaline, and the black colour radiating at the apex.

Male and *Female*. Length of body : 2.9–3.9 mm.; ovipositor : 0.8 mm.; wing : 2 7–3.4 mm.

DESCRIPTION:— Head very broad, a little broader than the thorax, entirely yellow and covered with a cinereous pulverulence; frons broad and very flat; the lunula well developed and fairly prominent; face a little shorter than the frons, concave in the middle and with a rather prominent epistoma; cheeks rather broad; occiput concave on its upper half and with a more or less distinct, double, blackish spot in the middle; ocelli blackish but the triangle is yellowish-grey; eyes rounded; antennae very short, being much shorter than the face and entirely yellowish; second joint prominent above and bearing some minute black bristles; third joint shorter than the two basal joints together, with the upper margin a little concave and the terminal angle not pointed; arista bare, yellowish and thickened at the base, but blackish for more than its apical half; proboscis thick, reddish-yellow; palpi very small much shorter than

the proboscis and with some minute, bristly hairs; *i.or.*4, three of which being more developed than the two *s. or.* and the fourth is much weaker and situated at the base of the antennae; all the cephalic bristles are pale yellowish, except the lower *s.or.* and the three much larger *i.or.* blackish; the upper *s.or.* are bent upwards and outwards.

Thorax, scutellum and mesophragma entirely black, but clothed with a dense yellowish-grey or sometimes cinereous, tomentum; the pubescence on the disc consists of rather thick, adpressed, pale yellow hairs and along the front border, especially on the humeri, it is often longer and decidedly bristly; all the bristles on the pleurae are short and pale yellow but on the disc they are brownish at the apex and inserted on small blackish dots; the *pt.* is stronger than the *mpl.* and the *st.* even stronger; scutellum with two *b.sc.* only, which are long, parallel, or convergent, and placed rather distant from the base.

Abdomen short, broad, entirely yellowish or greyish-yellow and without any bristles except at the apex of the male usually with a row of longish bristly hairs; the pubescence is similar to that of the thorax, but somewhat less dense and longer at the apex of the first segment on the sides; male hypopygium small, rounded, dark yellowish-grey; female ovipositor almost as long as the three apical segments of the abdomen together, flat, conical and very shining black.

Legs entirely yellow and rather bare; front femora with a row of four blackish bristles beneath and a row of much weaker yellowish bristles on the side and above.

Wings with a black wing pattern, radiating at the apex and hind border, with more than the basal third entirely hyaline; the black patch extends, from the base of the stigma, leaving the base of R1 cell hyaline, covering less than the apical half of R cell, and leaving the basal third of 1st M2 cell, 2nd. A cell and the axillary lobe hyaline; the dark patch contains some hyaline spots which on the front and hind margins appear like small indentations, and at the apex like deeper indentations or rays; in addition there are three rounded hyaline spots, or drops, not touching the wing margin, one in the basal third of R5 cell almost touching M1, one in 1st M2 cell below the radio-median cross-vein, and the third, which is the largest and elliptical in 2nd M2 cell near the median cross-vein; the marginal spots or indentations are : one in R 1 cell; oblique, touching the apex of the stigma and extending down to R2+3; one smaller spot near the apex of R3 cell, touching the tip of R2+3; three at the apex, one at the tip of R3 cell with its pointed apex extending a little over R4+5, one completely covering the tip of R5 cell, and one at the apex of 2nd M2 cell, extending a little over M1; an elliptical spot, and two spots in the apical third of Cu1 cell, which are

very variable in shape and often run together; sometimes there is also a very small rounded spot in 2nd M2 cell at the apex of M3+Cu1. All the veins are yellowish in the basal third of the wing; R4+5 and M1 are parallel except at their distal portion where they diverge; the inferior angle of Cu cell forms almost a right angle and is inconspicuously produced. Squamulae whitish; halteres yellow.

This species is common in almost every locality where its host plant grows. I have captured it in Wadi Hoff and its branches, Wadi Garawi, Wadi Digla, Wadi Rishrash and on the Suez Road. My dates extend from February 28th to May 10th 1923.

16. TEPHRITIS, Latreille.

Latr., Hist. Nat. d. Crust. et Ins., XIV. 389 (1804).

Ditricha p.p., Rond., Dipterol. Ital. Prodr., VII. Ortalid. 25. (1871).

Distinguished by the usually short but sometimes more or less long and geniculate proboscis, the bare R4+5, the reticulate wing pattern and the usually four scutellar bristles.

Head usually much broader than high; eyes rounded; frons broad; epistoma more or less prominent; proboscis usually short with the flaps sometimes prolonged and geniculate; antennae placed at the middle of the eyes with the third joint not more than twice the length of the second joint (usually only one and a half) and rounded at the upper corner; arista bare or microscopically pubescent; cephalic chaetotaxy complete; *oc.* strong; *s.or.* 2, the upper always whitish, the lower black; *i.or.* 2 or 3; *ocp.* strong; genal bristle more or less developed.

Thorax with a complete chaetotaxy; scutellum usually with four bristles.

Abdomen with lateral and terminal bristles; female ovipositor usually not longer than the three apical segments of the abdomen together, conical and flattened.

Legs fairly robust; front femora with one row of well developed bristles beneath; middle tibiae with a single spur; hind tibiae bare.

Wings usually long and narrow but sometimes rather broad with a reticulate pattern which is usually well marked and conspicuous but in rare cases the wings may be blackish with hyaline indentations and spots or the reticulation may be very faint; costal bristle usually strong or even double; R1 never reaching the radio-median cross-vein; R4+5 bare; R2+3, R4+5 and M1 usually straight and parallel, but sometimes the two latter diverge; the cross-veins are not always parallel and perpendicular, more or less approximated; inferior angle of Cu cell drawn out into a short and broad point as long as, shorter or rarely longer than the M cell.

TYPE : *Musca leontodontis* De Geer (1776).

TABLE OF EGYPTIAN SPECIES

1	(4)	Scutellum with 2 bristles ; wings not reticulate.	
2	(3)	Wings dark with hyaline indentations only	1 **desertorum** nov. spec.
3	(2)	Wings dark with hyaline indentations as well as spots	2 **pulcherrima** nov. spec.
4	(1)	Scutellum with 4 bristles; wings reticulate.	
5	(6)	Reticulation very faint	3 **lauta** Lw.
6	(5)	Reticulation dark.	
7	(8)	Proboscis geniculate, the recurrent portion as long as the basal	4 **conyzae** Frfld.
8	(7)	Proboscis geniculate or not, if geniculate the basal portion is always longer than the recurrent part.	
9	(10)	Wings with only 6 hyaline spots in R5 cell, the 5 apical ones of almost equal size	5 **argyrocephala** Lw.
10	(9)	Wings with more than 6 hyaline spots in R5 cell, of unequal size	6 **praecox** Lw.
11	(14)	Base of 1st M2 cell hyaline	
12	(13)	Apex of 1st M2 cell dark with one large hyaline spot close to the median cross-vein	7 **spreta** Lw.
13	(12)	Apex of 1st M2 cell dark with two or three small spots close to the median cross-vein	8 **matricariae** Lw.
14	(11)	Base of 1st M2 cell dark	9 **tessellata** Lw.

TEPHRITIS DESERTORUM nov. spec.
(Pl. V fig. 3)

DIAGNOSIS:— A small species easily distinguished by the scutellum possessing only one pair of *b.sc.* and by the wings which have their basal third hyaline as well as the extreme apex and the remaining surface blackish with large hyaline indentations at the fore and hind borders.

Male. Length of body : 2.5 mm.; wing : 2.3 mm.

Female, unknown.

DESCRIPTION:— Head entirely reddish-yellow; epistoma prominent; proboscis short but geniculate, reddish-yellow with the palpi yellow; *s.or.* 2. *i.or.* 3; genal bristle not strong but distinct, all the bristles are black except the upper *s.or.*, the *rt.*, the *prt.* and the *ocp.* pale yellowish.

Thorax entirely covered with a dense cinereous tomentum which extends over the whole of the pleurae, mesophragma and scutellum, the latter possessing only one pair of *b.sc.*; *mpl.* 1, accompanied by some yellow bristly hairs; all the bristles are yellow; the pubescence is uniformly yellowish all over.

Abdomen dark reddish-brown and possessing a very delicate cinereous tomentum which is much less dense than on the thorax; pubescence pale yellowish; some of the lateral and all the apical bristles are black.

Legs entirely reddish-yellow with a uniformly blackish pubescence.

Wings blackish, with the basal third hyaline as well as the extreme tip and the blackish area possessing one large hyaline indentation at the fore border and three smaller hyaline indentations at the hind border; the indentation at the fore or upper border begins immediately after the stigma with its inner lateral margin touching the apex of the stigma above and the radio-median cross-vein below; its outer margin runs immediately above the median cross-vein and its lower margin is limited at M3+Cu1; the three lower hyaline indentations are : one below the upper indentation and the radio-median cross-vein in Cu1 cell, the upper margin of which is before the middle of 1st M2 cell; one is at the base of 2nd M2 cell with its upper margin touching M1, and the third hyaline indentation, which is by far the smallest, is also in 2nd M2 cell but towards the middle of this cell. In other words the wings may be described as hyaline with two large complete transverse dark bands which are united by a thinner longitudinal band in the upper half of 1st M2 cell and with one large and one small hyaline indentation in 2nd M2 cell, leaving the basal third and the extreme apex hyaline.

The inferior angle of Cu cell is drawn out into a very short point, shorter than M cell; costal bristle fairly strong.

Squamulae whitish; halteres yellow.

Of this interesting species only one specimen is known so far, captured by Mr. T. W. Kirkpatrick in the North Galala Hills, Eastern Desert.

T. desertorum is very closely allied to the following species and to *T.* (*Urellia*) *guimari* Beck. from the Canary Islands, but is at once distinguished from both species by the general colour of the abdomen and the pattern of the wings.

TEPHRITIS PULCHERRIMA nov. spec.
(Pl. IV fig. 9)

DIAGNOSIS:— Allied to the preceding species but distinguished by the larger size and by the dark pattern of the wings which, in addition to the hyaline indentations at the fore and hind borders possess isolated hyaline spots in the dark area.

Male and *Female*. Length of body : 3.5 mm.; ovipositor · 0.5 mm.; wing : 3 mm.

DESCRIPTION:— Head entirely pale yellow to yellow owing to a very fine pulverulence; proboscis short but geniculate, yellow; palpi yellow to pale yellow; antennae yellow; *s.or.* 2; *i.or.* 3; genal bristle fairly well developed; all the bristles are brownish-yellow except the upper *s.or.* the outer *vt.*, the *pvt.*, the *ocp.* and the genal bristle white.

Thorax entirely covered with a dense yellowish-grey to cinereous tomentum which extends over the whole of the pleurae, mesophragma and scutellum, the latter possessing only one pair of *b.sc.*; all the bristles are brownish-yellow except the *p.npl.* whitish; the *mpl.* and the *pt.* are accompanied by some pale bristly hairs; the pubescence is uniformly pale, almost whitish.

Abdomen dark brown to pale reddish-yellow covered with a cinereous tomentum which is less dense than on the thorax and with a very pale pubescence; in the female the last abdominal segment is black; ovipositor very shining black, flattened and about as long as the two apical segments of the abdomen together.

Legs entirely yellow with a uniform blackish pubescence.

Wings characterised by the dark pattern which covers the apical two thirds of the wing, leaving the basal third and the extreme apex hyaline; the dark patch possesses one hyaline indentation at the fore border and three at the hind border as well as some isolated hyaline spots; the indentation at the fore border is not large, situated

on the apex of the stigma and extending down as far as R4+5, touching this vein; sometimes this indentation is interrupted by a thin dark line along R2+3 and in this case the lower margin of this therefore isolated spot does not touch R4+5; the hyaline indentations at the lower margin are : one in the apical half of Cu1 cell exactly below the radio-median cross-vein, with its upper margin almost reaching M3+Cu1; the second and third indentations are in 2nd M2 cell, the former which is by far the largest of the three lower indentations is at the base and its upper margin touches M1 close to the median cross-vein; the third lower indentation is the smallest and situated towards the middle of 2nd M2 cell and may be rounded or oblong. The isolated hyaline spots are variable in number, shape and position and are as follows : one oval spot at the base of R5 cell with its lower margin touching M1 and its upper margin not quite reaching R4+5; sometimes one smaller rounded spot in R5 cell, above the median cross-vein; but this spot is usually absent; one rounded spot at the apex of R cell with its upper margin touching R4+5, this spot is also frequently absent; one fairly large rounded spot in 1st M2 cell below the radio-median cross-vein with its lower margin touching M3+Cu1; sometimes this spot runs into the spot above it (the one at the apex of R cell); in addition there are two very small and rounded spots at the apex of 1st M2 cell and one at the hind border below the median cross-vein, but these are also usually absent; inferior angle of Cu cell drawn out into a very short but pointed angle, shorter than the M. cell; costal bristle not strong.

Squamulae pale yellow; halteres yellow.

All the known specimens of this interesting species are from Egypt. Seven of them (5 males and 2 females) are in my collection captured as follows : Wadi Hoff, 22.III. and 9.VI.1922; 7th Tour, Suez Road 23.VII.1922 and 3.VI.1924 ; Ezbet-el-Naghl 19.VII. 1922 and two specimens, both males, in the collection of the Ministry of Agriculture, captured by Mr. E. W. Adair in Wadi Hussein (1.VI.1919).

TEPHRITIS LAUTA Loew.
(Pl. V. fig. 7 and Pl. I fig. 11)

Lw., Zeitschr. f. d. ges. Naturw., XXXIV. Heft 7 et 8,18.11. (*Oxyna*) (1869).

DIAGNOSIS:— A rather thick-set, brownish-yellow species, easily distinguished by the very faint reticulation of the wings.

Male and *Female.* Length of body : 5.2—6 mm.; ovipositor : 1 mm.; wing : 4.4—4.9 mm.

DESCRIPTION.— Head entirely dull yellow and covered with a very delicate white pulverulence; proboscis dark brownish-yellow; ocellar triangle blackish; antennae yellow with the third joint darker and quite rounded at the tip; genal bristle very strong and accompanied by some pale bristly hairs; *s.or.* 2, *i.or.* 3; all the bristles are blackish except the upper *s.or.* the outer *vt.* the *pvt.* and the *ocp.* whitish.

Thorax entirely covered with a dense characteristic brownish-yellow tomentum, which, in certain lights has a golden-brown reflection; on the disc there are three very distinct darker longitudinal lines; the tomentum however is often cinereous along the lower and hind margins of the pleurae and on the mesophragma. All the bristles are dark brown to blackish except the posterior *npl.* white; the *mpl.* and *pt.* are accompanied by some pale bristly hairs; the pubescence is uniformly pale yellowish; scutellum with four bristles.

Abdomen usually entirely orange-yellow but often the second, third, fourth and fifth segments are blackish except on the lower margins reddish-yellow; it possesses a greyish tomentum which is rather thin and inconspicuous; the pubescence is uniformly yellowish, so are the lateral and rather strong apical bristles; ovipositor shining black, as long as the three apical segments of the abdomen together and with a similar pale pubescence.

Legs entirely yellow with a uniform blackish pubescence.

Wings with all the veins and the stigma yellow and characterised by the very faint reticulation on the apical two thirds, leaving the basal third almost entirely hyaline; in other words the apical two thirds of the wings are greyish with very numerous small, rounded hyaline spots; median cross-vein not straight and situated at rather a greater distance than usual from the radio-median cross-vein; Cu2 with a bend in the middle, a character which is rather rare in the other Egyptian members of this genus.

Squamulae and halteres yellow.

This interesting species is not common in Egypt. I have captured it in Wadi Hoff during the months of May and June only (1921, 1922) by "sweeping" the inflorescence of *Stachys aegyptiaca* and *Lavandula coronopifolia* but the food plant is unknown.

Up to the present *T. lauta* was known only from the Island of Rhoda in the Aegean.

TEPHRITIS CONYZAE, Frauenfeld.
(Pl. V fig. 4 and Pl. I fig. 14)

Frfld., Sitzungsber. d. Kais. Akad. d. Wiss., XXII. 555. f. 11 (1856); Lw., Berlin. entom. Zeitschr., V 285. t. II. f. 18. (1861).

DIAGNOSIS:— A small brownish-grey species with reticulate wings and a fairly long proboscis, the terminal portion of which is as long as the basal portion.

Male and *Female*. Length of body : 2.5—2.8 mm.; ovipositor : 0.7—0.8 mm.; wing : 2—2.4 mm.

DESCRIPTION:— Head fairly rounded and entirely yellow, except along the eye margins and face whitish owing to a very delicate tomentum of that colour; proboscis reddish-yellow with the apical portion as long as the basal, the latter being usually darker in colour, almost dark reddish-brown; antennae and palpi reddish-yellow; ocellar triangle blackish; epistoma fairly prominent; *i.or* 2, *s.or*. 2; all the bristles are black except the upper *s.or.*, the outer *vt.*, the *pvt.* and the genal bristle whitish.

Thorax entirely covered with a dense brownish to brownish-grey tomentum with the three darker longitudinal lines on the disc usually quite distinct; all the bristles are black except the *pt.* white; scutellum with four bristles but the *a.sc.* are very weak, being not more than one fourth the length of the *b.sc.*; the pubescence on the thorax is uniformly pale yellowish and on the pleurae however it is much finer.

Abdomen entirely covered with a very delicate cinereous pulverulence; the pubescence is uniformly pale yellowish and longer and bristly on the lower margins of the segments and the apical bristles are black. Ovipositor entirely shining black, about as long as the abdomen and possessing a very delicate greyish pubescence.

Legs with all the femora usually dark brown or blackish except their extreme tips which are yellow to reddish-yellow; all the tibiae and tarsi are reddish-yellow.

Wings with a reticulate pattern which is very characteristic of the genus and greatly resembling those of the European *Oxyna absinthii* F. (the two species however are immediately distinguished by the relative lengths of the portions of the proboscis, the terminal portion being always shorter than the basal portion in *absinthii*, and by the general colour of the body); they are brownish and the hyaline spots are rather small, rounded and almost equal in size; these hyaline spots are as follows : 2 in 2nd C. cell, one covering the apex and the other close to the base; 5 in R1 cell; 6 or 7 in R3 cell; 3 in

R cell; 5 to 7 in R5 cell, some of which often run together; 3 or 4 spots in 1st M2 cell; 4 or 5 in 2nd M2 cell and 5 or 6 spots in Cu1 cell; the M. and Cu cells are usually entirely hyaline except the inferior angle of the latter brown; the extreme wing base is also hyaline; costal bristle very weak or absent; stigma dark brown; radio-median and median cross-veins not parallel and the latter is somewhat wavy; inferior angle of Cu cell drawn out into a fairly long but not very pointed angle, longer than M cell.

Squamulae whitish; halteres yellow.

T. conyzae is so far known from Egypt only and Frauenfeld as early as 1856 gives as food plant for this species *Conyza aegyptiaca*. I have captured 7 males and 3 females on February 14th 1922, in an old garden at Koubba, but have not been able to ascertain yet whether the above mentioned food plant occurs in that locality. I have failed to recapture this interesting species since and I feel convinced that more success will be obtained by collecting the capitulums of the host plant in order to rear the adults.

I have also in my possession two specimens caught by Maître Ferrante and labelled "Cairo 1905."

TEPHRITIS ARGYROCEPHALA, Loew.
(Pl. IV fig. 2 and Pl. I fig. 25)

Lw., Germ Zeitschr., V. 372. t. I. f. 30. (*Trypeta*) (1844) et Trypetid., 91. 10. t. XVII. f. 3. (*Oxyna*) (1862); Zett. Dipt. Scand., VI. 2238. 41. (1847); Frfld., Sitzungsber. d. Kais. Akad. d. Wiss., XXII. (*Oxyna*) (1856) et Verh. zool.-bot. Ges. Wien, XIII. 220. (*Oxyna*) (1863); Schin., Verh. zool.-bot. Ges. Wien, VIII. 669.65. (*Oxyna*) (1858) et Faun. Austr., II. 155. (1864); Kaltenb., Pflanzenf., 326.13. (*Trypeta*) (1872).

DIAGNOSIS:— A medium sized species, much resembling *T. praecox* Lw. but distinguished by the wings which possess only 6 hyaline spots in R5 cell, the 5 apical ones being of almost equal size.

Female. Length of body : 4 mm.; ovipositor : 0.8–1.0 mm.; wing : 4 mm

DESCRIPTION:— Frons deep dull reddish-yellow, except on the upper margin yellowish-grey and whitish along the eye margins owing to a very delicate shining white pulverulence which extends over the face, epistoma, the broad cheeks and the palpi; proboscis reddish-yellow in front but dark brown, almost blackish behind and

with the terminal portion much shorter than the basal; occiput dark brownish-grey and possessing a grey pulverulence; vertex yellowish-grey with the ocellar triangle blackish; antennae reddish-yellow and covered with a very minute whitish pubescence and with a black, microscopically pubescent arista; there are some small pale hairs along the eye margins, cheeks and occiput, especially below where they become much longer; *s.or.* 2, *i.or.* 2; all the bristles are black except the upper *s.or.*, the outer *vt*, the *prt.*, the *ocp.* and the genal bristle pale yellowish.

Thorax entirely covered with a very dense brownish-grey pulverulence which, on the pleurae is greyish. The pubescence is very pale yellowish; scutellum yellow at the apex and bearing 4 bristles; all the bristles are black except the posterior *npl.* and the *pt.* yellow.

Abdomen entirely black and covered with a dense brownish-grey pulverulence like the thorax; the pubescence is longer as usual, pale yellow and there are a few rather short black bristles at the apex of the fifth segment; ovipositor shining black and as long as the two apical segments of the abdomen together.

Legs reddish-yellow except for an elongated spot on the outer side of the front femora, a smaller spot on the middle femora and the basal two thirds of the hind femora dark brown. Sometimes the brown may be more extensive but the tips of the femora are always reddish or rusty-yellow.

Wings hyaline with a dark brown reticulation which is more intensive on the stigma, the latter being very dark brown with a minute rounded yellowish spot in the middle and touching the costa; costal bristle double; the base of the wing is almost entirely hyaline except for a brown spot below the humeral cross-vein, a quadrate spot across the middle of 2nd C. cell and a smaller spot near the base of R cell; the rest of the wing is best described as brown with rounded hyaline spots as follows : 3 large equidistant, more or less rounded spots in R1 cell, after the stigma, the upper and lower margins of which touch the costa and R2+3 respectively; 6 to 7 variable spots in R3 cell; 2 fairly large spots in R cell; 6 hyaline spots only in R5 cell, the five apical ones being of almost equal size; 2 large and 1 to 2 very small spots in 1st M2 cell; 1 large and 3 medium spots in 2nd M2 cell, the large one often running into one or two of the smaller ones below it; 7 to 8 spots running together and extending over almost the whole of Cu1 and 2nd A cells, and finally 1 isolated spot below the median cross-vein.

Squamulae whitish; halteres yellow.

Becker states that he has found this species in Cairo but I have not yet seen a single specimen from Egypt. The above description is made from a male given me by Dr. Becker, originating from St

Moritz and a female from Italy, kindly sent to me by Professor Bezzi, which, I must admit vary somewhat from Loew's and Schiner's descriptions. I cannot find, for instance, any traces of "4 rows of dark spots on the abdomen."

T. argyrocephala may prove later to be indigenous to Egypt, especially if one should gather methodically the capitulums of various *Compositae*. Frauenfeld has bred the adults from the flower-heads of *Aster amellus*.

TEPHRITIS PRAECOX, Loew.
(Pl. V fig. 1)

Lw., Germ. Zeitschr., V. 391. t. II. f. 44. (*Trypeta*) (1844) et Trypetid., 102. 9. t. XX. f. 4. (1862); Schin., Verh. zool.-bot. Ges. Wien, VIII. 674. 83 (1858); Rond., Dipterol. Ital. Prodr., VII Ortalid. 23. 22 (1871); Beck., Zeitschr. f. Hymen. u. Dipt., V. 388. (1907).

DIAGNOSIS:— A brownish-grey species distinguished by the wings which have more than 6 hyaline spots of unequal size in R5 cell and by the femora which are blackish except their extreme apices yellow.

Female. Length of body : 4.4 mm.; ovipositor : 0.7 mm.; wing : 3.6 mm.

DESCRIPTION:— Head entirely yellow except on the lateral margins of the frons, face, jaws and antennae pale yellow owing to a very delicate and minute white pulverulence; the occiput is blackish except its upper margin dark yellow and its lateral margins pale yellow; *s.or.* 2, *i.or.* 2; the *ocp.* is composed of very minute black bristles amongst which is found, here and there one large obtuse yellow bristle; all the bristles are black except the upper *s.or.*, the *prt.*, the outer *vt.* yellow and the genal bristle almost white.

Thorax entirely covered with a dense greyish-brown to brownish-grey tomentum which extends over the pleurae, mesophragma and scutellum, and, which, on the disc, in certain lights has a golden reflection; scutellum with 4 bristles; all the bristles are black except the *pt.* yellow; the pubescence is uniformly short and yellow all over.

Abdomen entirely covered with a brownish-grey tomentum which is much less dense than on the thorax; pubescence uniformly pale yellowish; apical bristles black; ovipositor as long as the three apical segments of the abdomen together and much less flattened than in the other species of this genus; in fact the single female which I possess from Kerdacé has an ovipositor which may be decidedly

described as cylindrical; it is very shining black with a very delicate brownish pubescence.

Legs with the femora blackish except their extreme apices yellow; the coxae, tibiae and tarsi are entirely yellow to reddish-yellow.

Wings very similar to those of the preceding species but distinguished by the darker colouration and by the more numerous hyaline spots in R5 cell which are of unequal size; the basal third of the wing is hyaline with some dark spots which are very similar as in *T. argyrocephala*, but the hyaline spots in the apical two thirds of the wing are as follows : the stigma is dark brown except for a rounded yellowish spot immediately after the middle; R1 cell contains 4 hyaline spots, the first of these, which is the smallest is near the base and immediately below the base of the stigma, the three others are in the apical half of the cell, equidistant and the first of these touches the apex of the stigma; in R3 cell there are from 6 to 7 spots, those in the basal half are rounded and usually very small and may be 2 or 3 in number, then come two quadrate spots, close to each other after the radio-median cross-vein and two (usually running together and forming one large spot) at the tip, superimposed, the upper one touching the tip of R2+3, and the lower the apical portion of R4+5; R cell contains two fairly large rounded spots towards the middle, the lower margins of which touch M1; 7 to 8 spots in R5 cell, which are unequal, the largest being near the base, above the median cross-vein, two or three small, rounded spots towards the middle and four rounded, almost equal spots in the apical half of the cell; in 1st M2 cell there are 4 hyaline spots, one very large in the basal half and three smaller spots in the apical half; 2nd M2 cell also contains 4 spots and Cu1 cell several large hyaline spots which almost always run together; costal bristle double ; median cross-vein not straight; all the veins are yellow but blackish in correspondance with the dark spots.

Squamulae pale yellow; halteres yellow.

Only a single specimen, a female, is so far known from Egypt, which I have captured at Kerdacé on 27.V.21.

T. praecox is known in Central Europe and has been recorded from Asia Minor, Algeria, Madeira and Canary Islands.

As far as I am aware the food plant of this species is unknown.

TEPHRITIS SPRETA, Loew.
(Pl. IV fig. 1)

Lw., Berlin. entom. Zeitschr., V. 297. t. II. f. 26. (1861).

matutina Rond., Dipterol. Ital. Prodr., VII. Ortalid. 22.20. (1781); Beck., Zeitschr. f. Hymen. u. Dipt., V. 387. 418. (1907).

DIAGNOSIS:— Allied to *T. matricariae* but distinguished from it by the general colour of the wings which is from brownish-grey to dark grey and by the apex of 1st M2 cell which is dark with one or at most two hyaline spots close to the median cross-vein.

Male and *Female.* Length of body : 4.9–5.2 mm.; ovipositor : 0.9 mm.; wing : 4.3–4.6 mm.

DESCRIPTION:— Head yellow to orange yellow except along the eye margins; face and cheeks pale yellowish owing to a very delicate shining white tomentum which frequently extends over all the occiput; antennae reddish-yellow with a blackish microscopically pubescent arista; ocellar triangle blackish; epistoma not at all prominent; proboscis short, reddish-brown with yellow to pale yellow palpi; *s.or.* 2, *i.or.* 2; genal bristle well developed; all the bristles are blackish except the upper *s.or.*, the *pvt.*, the outer *vt.* and the *ocp.* very pale yellowish.

Thorax black except on the humeral and prealar calli usually yellow (this is seen in rubbed specimens) and covered with a dense tomentum which, on the disc and scutellum is greyish-brown and on the pleurae and mesophragma cinereous; the lateral margins of the scutellum and extreme tip are usually reddish-yellow (as in *matricariae*); scutellum with 4 bristles; all the bristles are blackish except the *mpl.* and *pt.* brownish-grey; the pubescence is uniformly pale yellowish.

Abdomen black except the lower margins of the segments usually dark reddish-brown and entirely covered with a delicate cinereous tomentum; ovipositor as long as the two apical segments of the abdomen together and usually entirely shining black; sometimes however the two lateral margins of the apical half or more are broadly reddish-yellow; the pubescence on the abdomen and on the basal half of the ovipositor is uniformly pale yellow but it is brownish and much finer on the apical half of the latter; the apical bristles are black.

Legs entirely pale yellow to reddish-yellow with a uniform blackish pubescence.

Wings of a dark grey to brownish-grey colour and rather large, rounded, hyaline spots which are very similar to *T. matricariae*; in fact I have been unable to find so far a single distinguishing character between the two species; the extreme wing base and 1st C.

cell are hyaline; 2nd C. cell with 2 large hyaline spots, one in the basal half and one occupying the apical half of the cell; the stigma is blackish with a yellowish spot which varies in size, usually it is in the apical half but does not extend to the apex and sometimes it occupies all the apical half; R1 cell with 4 hyaline spots, the two in the basal half being by far the smallest; R3 cell with 6 to 8 hyaline spots of varying size and shape; R cell with 7 spots; R5 cell with 5 to 7 spots; 1st M2 cell with 5 to 7 spots, the apex of this cell being blackish with one or at most two hyaline spots close to the median cross-vein; 2nd M2 cell with 4 to 5 hyaline spots; Cu1 cell with 4 to 5 spots which usually run together, except the apical one, below the median cross-vein and touching the lower margin; M. and Cu cell are almost entirely hyaline except for a small brownish-grey spot usually covering the inferior angle of Cu cell and extending over the apex of Cu2+A2; the axillary lobe is entirely hyaline; all the veins are identical with those of *T. matricariae*.

Squamulae pale yellow, halteres yellow.

In comparing the descriptions of *T. matutina* and *T. spreta* I have found no essential difference between them and I came to the conclusion that they referred to the same species. Prof. Bezzi has confirmed this conclusion by an examination of the type of *matutina* which he agrees to be a specimen of *spreta*.

I have captured a large series of 60 specimens of this species at Mazghouna 30.III.1923. It is rather variable and some of the forms are quite indistinguishable from *matricariae*. Without a series of the latter it is impossible to give any constant distinguishing character and it is quite possible that *spreta* may prove to be only a variety of *matricariae* and become a mere synonym. Owing to the rareness, up to the present time, of *spreta* (=*matutina*) previous authors have not had facilities for settling the relation of *matricariae* to *spreta*, even if they had suspected them to be the same.

TEPHRITIS MATRICARIAE, Loew.
(Pl. IV fig. 4)

Lw., Germ. Zeitschr., V. 389. t. II. f. 43 (*Trypeta*) (1844) et Trypetid., 102. 7. t. XX. f. 3. (1862); Frfld., Sitzungsber. d. Kais. Akad. d. Wiss., XXII. 556. (1856) et Verh. zool.-bot. Ges. Wien, XI. 167. (1861); Schin., Verh. zool.-bot. Ges. Wien, VIII. 674. 82. (1858); Kaltenb., Pflanzenf., 343. 16. (*Trypeta*) (1872); Beck., Zeitschr. f. Hymen. u. Dipt., 387. 7. (1907).

=*spreta* Lw ?

DIAGNOSIS:— Apex of 1st M2 cell dark and with two or three small hyaline spots close to the median cross-vein.

DESCRIPTION, ♂ and ♀ "Easily distinguished from the preceding species [*T. conura*, *T. simplex* Lw.] by its smaller size and by the network of the wing-markings which are equally extensive and connected but with much larger meshes. Colour greyish-yellow. Frons moderately broad. Eyes large, cheeks narrow. The face is moderately concave and the epistoma distinct but not very prominent. Thorax without pattern. Scutellum with the lateral margins usually distinctly clay-yellow. Abdomen somewhat blackish-grey. The short hairs on the thorax and abdomen are pale all over but the usual bristles are black. Ovipositor as long as the two last segments of the abdomen together, or perhaps a very little longer, shining black, but at the centre of the lateral margin occasionally red. The pubescence near the base of the ovipositor is pale. Legs yellowish-brown, the femora being sometimes a little darker. The brownish-black wing-markings are very extensive and moderately connected but with a very wide mesh. The two areas which are usually less interrupted and consequently darker are smaller and separated from each other; the second [sic] of these has only a single clear spot on the fore margin. Near the posterior cross-vein, however, the dark colouration is more concentrated but without it forming a conspicuous, large, darker area; at the extreme tip of the wing there is a large clear spot and in front of this there is a transverse band which is usually very irregular and formed by similar clear spots and which often completely separates the blackish spots situated at the apices of the third and fourth longitudinal veins from the remaining network of the wings. The stigma with a clear spot.

This species is very common in Asia Minor and in the whole of Southern Europe. I have captured it in great quantity at Rhoda on *Matricaria*, but without my being able to ascertain definitely if the larva feeds on this plant (as I suspect) or not."

I have given above Loew's description of this doubtful species and it can be seen that no reliable specific distinction is given.

I have seen no Egyptian specimens which I can identify as this species and moreover I possess one specimen (a ♀), of Loew's original types, kindly given to me by Dr. G. Enderlein and I fail to separate it from *T. spreta* Lw. In addition Prof. Bezzi is unable to give me an opinion on this subject as he writes to me that he does not possess this species and that "it appears that it differs from *spreta* Lw. by its wing pattern which is closer, darker and somewhat resembling the pattern of the species of *Euaresta* at the extre-

mity of the wing" Becker * states that he has found *T. matricariae* in Cairo and neighbourhood, but I presume that he means *T. spreta*.

TEPHRITIS TESSELLATA, Loew.

Lw., Germ. Zeitschr., V. 396. t. II. f. 49 (*Trypeta*) (1844). Linn. entom., I. 518.59. (*Trypeta*) et Trypetid., 90.8. t. XVII. f. 1-2. (*Oxyna*) (1862); Zett., Dipt Scand., VI. 2236. 50. (1847); Frfld., Sitzungsber. d. Kais. Akad. d. Wiss, XXII. 554. (*Oxyna*) (1856) et Verh. zool.-bot. Ges. Wien., XI. 164. (*Oxyna*) (1861); Schin., Verb. zool.-bot. Ges. Wien, VIII. 671. 71. (*Oxyna*) (1858) et Faun. Austr., II. 156. (1864); Kaltenb., Pflanzenf., 396. 16 et 399. 45. (*Trypeta*) (1872); Wachtl, Wien. ent Zeitg., I. 277. 12. (*Oxyna*) (1882); Beck., Acta Soc. scient. Fenn., XXVI. 61. 126 (*Oxyna*) (1900) et Mitteil. Zool. Mus. Berlin, II. 135.218 (*Oxyna*) (1903).

leontodontis Zett., Ins. Lapp., 745.5. *var b.c.* (1847).

punctella var. β. Fall., Dipt. Suec. Ortalid., 13.21. (1820).

DIAGNOSIS:— A medium size species much ressembling *T. matricariae* but distinguished from it by the wings which possess the base of 1st M2 dark and by the general colour.

Male and *Female*. Length of body : 3.5–4.3 mm.; ovipositor : 0.8 mm.; wing : 4 mm.

DESCRIPTION:— Head entirely yellow to reddish-yellow, but the frons is usually greyish-yellow above and reddish-yellow on its lower two thirds; occiput blackish except on the upper margin and below greyish-yellow like the vertex; vertical triangle blackish; the head is covered with a delicate tomentum which is conspicuously whitish on the eye margins, the cheeks and antennae; proboscis short, with the basal portion reddish-yellow in front but blackish behind, and the terminal portion reddish-yellow; *s.or.* 2, *i.or.* 2; all the bristles are black except the upper *s.or.* the outer *vt.*, the *pvt.* the *ocp.* and the genal bristle yellowish.

Thorax densely covered with a tomentum which is usually grey to brownish-grey on the disc, greyish-brown on the sides and upper margins of the pleurae and greyish again on the pleurae below : occasionally the three darker longitudinal lines are just perceptible on the disc; scutellum with 4 bristles and possessing a grey or greyish-yellow tomentum.

(*) Becker, Dr. Th., Mitteil. Zool. Mus. Berlin, II. 132.214, 1903.

Abdomen entirely black and possessing a fine grey pulverulence which is darker in two rounded aeas, one on each side of the median line in the second, third and fourth segments respectively; in other words the abdomen is entirely grey except for two large rounded spots on each of the three apical segments; very often however these spots are absent and the abdomen is entirely grey to dark brownish-grey. The pubescence is pale and longer as usual than on the thorax, especially on the lower and lateral margins of the segments; in addition there are some fairly short black bristles at the tip; male hypopygium very dark reddish-brown but reddish-yellow at the extreme tip; ovipositor shining black, as long as the two apical abdominal segments together and possessing a very delicate and inconspicuous dark greyish pubescence.

Legs with all the femora blackish except on the apical third reddish yellow and the tibiae and tarsi reddish-yellow; the blackish colour is often however, more extensive on the femora; the pubescence is uniformly dark brown to blackish all over.

Wings very similar to those of the preceding species but the base of 1st M2 cell is dark instead of being hyaline and the hyaline spots are disposed as follows : 2 large spots in R1 cell, one small near the base and one near the apex; 5 to 6 spots in R3 cell, the two or four of which, in the basal third are very small and the three others much larger; 2 medium sized spots in the apical half of R cell; only 6 spots in R5 cell, the basal one being the largest and the 5 apical ones of almost equal size; 4 spots in 1st M2 cell, two of which are larger than the others; 2nd M2 with 4 hyaline spots, three of which run together and the fourth isolated, near the tip and touching the lower margin; the spots in Cu1 cell all run together except for a small spot below the median cross-vein on the lower wing margin, thus rendering this cell hyaline except for two or three brownish indentations and one spot covering the inferior angle of Cu cell; the wing base is hyaline except for an oblique dark brown spot covering the humeral cross-vein and the base of 2nd C. cell, a quadrate, dark brown spot in the middle of the same cell, one over the bases of R1, R2+3 and R4+5 and one small spot near the latter, in the basal third of R cell; median cross-vein not straight.

Squamulae pale yellow; halteres reddish-yellow.

This species is extremely variable and Loew had attempted to describe some of the chief varieties but he found it an almost impossible task, owing to the lack of clear distinctness between the forms and the variation in the colour of the legs, the spots of the wings, etc., in almost every individual.

Frauenfeld states that he has bred the adult of this species from the flower-heads of *Taraxacum officinale* in Europe but Loew

remarks that he is in doubt as regards this statement owing to the fact that no sharp distinctness existed at that moment between *tessellata* and another closely allied species (*O. producta* Lw.) with which the above species has always been confused.

Kaltenbach gives as food plant for this species *Sonchus arvensis*, *Tragopogon*, *Podospermum* and *Apargia* sp.

In Egypt the food plant is unknown. *T. tessellata* is not common. I have up till now captured 6 specimens only, four males and two females from the Mariout district, 5 and 21.IV.1921, and Becker had captured one pair in Alexandria in May 1899.

T. tessellata is known in Europe and has been recorded from Siberia, Chinese Turkestan, Algeria, Morocco, Madeira and Canary Islands and from the Oriental Tibet.

17. TRYPANEA, Schrank.

Schrank, Briefe Danaumoor, 147. (1795).

Actinophora, Rond., Dipterol. Ital. Prodr., VII. Ortalid. (1871).

Ditricha p.p., Rond., Dipterol. Ital. Prodr., VII. Ortalid. (1871).

Urellia, Rob.-Desv., Myod., 775. (1830).

Allied to *Tephritis* but distinguished from it and from other genera by the dark pattern of the wings which is star-shaped and limited to the apex, by the scutellum usually possessing only one pair of *b.sc.* and the slender body.

Head broader than high; frons broad; eyes rounded; epistoma fairly prominent; cheeks rather narrow; proboscis short, geniculate but the flaps not much prolonged; antennae placed at the middle of the eyes, with the third joint broad, more than twice the length of the second joint and pointed at the tip, above; arista bare; *oc.* fairly strong; *s.or.* 2, the upper short and white, *i.or.* 3 or 2; *ocp.* well developed, genal bristle fairly well developed to weak.

Thorax with a complete chaetotaxy; 1 *mpl.;* scutellum usually with only one pair of *b.sc.* but sometimes the *a.sc.* is also present.

Abdomen usually slender with weak lateral and apical bristles; female ovipositor conical, flattened and fairly short.

Legs as in *Tephritis*.

Wings characterised by the dark pattern which is star-shaped and limited to the apex, the remaining surface being hyaline or with very few spots; in any case the wings are not reticulate.

TYPE : *Musca stellata*, Fuessly (1775).

Only four species of this comparatively small genus are known so far from Egypt, three of which, *amoena*, *stellata* and *eluta*, have a wide geographical distribution. *T. augur* is so far known only from Persia, Algiers and Egypt.

The members of this genus are all flower-head feeders and they seem to be entirely confined to the Natural Order *Compositae*.

TABLE OF EGYPTIAN SPECIES

1 (6) *i.or.* 3.

2 (3) Scutellum with 4 bristles; wings pale with faint markings only .... 1 **T. eluta,** Meig.

3 (2) Scutellum with 2 bristles; wings with a dark area near the apex from which radiate several narrow bands like spokes of wheel (star-shaped).

4 (5) 3 dark radiating narrow bands reaching posterior apical margin of wing ...... 2 **T. amoena,** Frfld.

5 (4) Only 2 dark radiating narrow bands reaching posterior apical margin of wing 3 **T. stellata,** Fuessly.

6 (1) *i.or.* 2; 5 dark radiating narrow bands reaching wing tip .... 4 **T. augur,** Frfld.

TRYPANEA ELUTA, Meigen.
(Pl. V fig. 2)

Meig., Syst. Beschr., V. 344. t. L. f. 13 (*Trypeta*) (1826); Macq., Suit. à Buff., II.472.14 (*Acinia*) (1835); Lw., Germ. Zeitschr., V. 416. t. II. f. 67 (*Trypeta*) (1844) et Trypetid., 117. 1. t. XXIV. f. 3. (*Urellia*) (1862); Duf., Ann. Soc. Entom. Fr., II. série. 49. (*Urellia*) (1849); Frfld., Sitzungsber. d. Kais. Akad. d. Wiss., XXII. 544 (*Urellia*) (1856) et Verh. zool.-bot. Ges. Wien, XIII. 218. (*id.*) (1863) ; Schin., Verh. zool.-bot. Ges. Wien, VIII. 674.85. (*Urellia*) (1858) et Faun. Austr., II. 171. (*id.*) (1864); Fr-Löw., Verh. zool.-bot. Ges. Wien, XVI. 949. (*Urellia*) (1866); Kaltenb., Pflanzenf., 386.45. (*Trypeta*) (1872); Beck., Zeitschr. f. Hymen. u. Dipt., V. 390.424 (*Urellia*) (1907) et Annuair. d Mus. Zool. d. l'Acad. Imp. d. Scienc. d. St. Petersb., XVII. 644. 312 (*Trypanea*) (1912).

helianthi Rond., Dipterol. Ital. Prodr., VII. Ortalid. 12.1. (1871).

DIAGNOSIS:— Distinguished by the 4 scutellar bristles and by the usually weak and diffuse wing pattern.

Male and *Female*. Length of body : 4—5.9 mm.; ovipositor : 2.9 mm.; wing : 4.4—5 mm.

DESCRIPTION:— Head yellow and entirely covered with a very fine white tomentum which is rather more dense along the eye margins and towards the middle of the face; occiput blackish towards the centre, above the ocellar triangle also blackish; all the bristles are blackish-brown except the upper *s.or.* the outer *vt.*, the *ocp.* white and the small but distinct genal bristle black.

Thorax and scutellum entirely covered with a dense cinereous or yellowish-grey pulverulence which extends over the whole of the pleurae and mesophragma; the lateral margins of the disc and upper margins of the pleurae however are often covered with a yellow or golden-yellow tomentum; usually traces of the three narrow and darker longitudinal lines are seen on the upper half of the disc; all the bristles are brownish-black except the *p.npl.* and the *pt.* yellow; the *mpl.* and *pt.* are accompanied by some pale bristly hairs; scutellum with 4 bristles but the *a.sc.* are much weaker than the *b.sc.* and converging at the apex; the pubescence on the thorax and scutellum is very pale yellow, scattered and somewhat longer at the hind margin.

Abdomen entirely black but appearing dark grey owing to a grey pulverulence which is much less dense than on the thorax, hence the abdomen is darker in colour; ovipositor as long as or even slightly longer than the abdomen, very shining black; the bristles are from dark grey to blackish; the pubescence is from pale yellow to yellow on the abdomen and ovipositor, except on the apical third of the latter blackish, much finer and inconspicuous.

Legs entirely reddish-yellow, with a short uniform blackish pubescence; front femora with a row of bristles beneath; middle tibiae with a single spur.

Wings characterised by being hyaline with some pale brown markings or spots which are often very indistinct; these brown markings are situated between the stigma and the apex of R2+3 and leaving always the tip and the lower margin broadly hyaline; the stigma is yellow with the extreme tip usually brownish-black; the veins are blackish except on the basal third yellow; inferior angle of Cu cell drawn out into a very short but pointed angle, shorter than the M. cell; costal bristle double.

Squamulae whitish; halteres yellow.

T. eluta is common almost everywhere, in Lower as well as in Upper Egypt. I have capturea it in Mariout, Port-Said, Cairo, Alexandria, Suez Road, Helwan, Wadi Hoff, Wadi Rashid, Wadi Garawi, Wadi Tih, Wadi Rishrash, Sakkara, Mazghouna, Kom-

Ombo, Keneh, Asswan and in Wadi Um-Biar, near Kosseir. My dates extend from January 12th to December 20th 1922. It is recorded from other parts of North Africa, Europe, Asia Minor, Persia, Chinese Turkestan and Canary Islands.

I have recently bred *T. eluta* from the capitulum of *Silybum marianum* from Ezbet-el-Nakhl (20.V.1924) and from *Centaurea pallescens* and *aegyptiaca* (III.—VI.1924) from Kerdacé and Heliopolis. In Europe the larva is known to feed in the flower-heads of several *Compositae* such as *Onopordon*, *Amberboa* and *Centaurea*.

TRYPANEA AMOENA. Frauenfeld.
(Pl. V fig 6)

Frfld., Ber. d. K.K. Akad., XXII. 542. f. 2. (*Trypeta*) (1856) et Verh. zool.-bot. Ges. Wien, XI. 165. (*Urellia*) (1861); Wollaston, Ann. Mag. of Nat. Hist., I. 269 (*Tephritis*) (1858); Schin., Verh. zool.-bot. Ges. Wien, VIII. 682.116. (*Urellia*) (1858) et Faun Austr., II. 170. (*Tephritis*) (1864); Lw., Trypetid., 120. 5. t. XXV. f. 2. (*Urellia*) (1862); Kaltenb., Pflanzenf., 390.6 et 394.34 (*Tephritis*) (1872); Beck., Zeitschr. f. Hymen. u. Dipt., V. 385.414 (*Urellia*) (1907) et Annuair. d. Mus. Zool. d. l'Acad. Imp. d. Science de St. Petersb., XVII. 643.310 (*Trupanea*) (1912).

parisiensis Rond., Dipterol. Ital. Prodr., VII. Ortalid. 29.2. (*Ditricha*) (1871).

radiata p.p., Walk., Entom. Mag., III. 74. (incl. f. 19.) (*Urellia*) (1844).

stellata Lw., Germ. Zeitschr., V. 411. 71. *var.*1. (*Trypeta*) (1844).

DIAGNOSIS:— Distinguished by the 3 dark radiating narrow bands reaching the posterior apical margin of wing.

Male and *Female*. Length of body : 3.2–5 mm.; ovipositor : 1.1 mm.; wing : 3.3–4.3 mm.

DESCRIPTION:— Head entirely pale yellow and covered with a delicate white tomentum all over; proboscis and palpi yellow; antennae with the third joint usually brownish-yellow; eyes of a beautiful iridescent metallic green colour when alive, which colour often persists in dried specimens; all the bristles are blackish-brown except the upper *s.or.*, the *vt.*, the *pvt.* and the *ocp.* pale yellowish; often the longer *vt.* is brown.

Thorax, scutellum, pleurae and mesophragma entirely grey to yellowish-grey owing to their being covered with a very dense tomentum of that colour; scutellum with only one pair of *b.sc.*; all the

bristles are greyish-brown except the *p.npl.* and the *pt.* pale yellow; the *npl.* and the *pt.* are accompanied by some pale bristly hairs; pubescence pale yellow.

Abdomen entirely covered with a dense yellowish-grey tomentum and a pale yellow pubescence like the thorax; the short lateral bristles are yellowish but the longer apical bristles are usually brown; ovipositor very shining black and about as long as the two apical segments of the abdomen together; its pubescence is pale yellowish on the basal half, but brown and finer on the apical half.

Legs entirely yellow to reddish-yellow; front femora with a row of bristles beneath; middle tibiae with a single spur.

Wings hyaline with a characteristic dark patch at the upper margin near the tip, from which radiate several dark narrow bands; the first of these bands arises from M1, a little before the radio-median cross-vein and extends upwards obliquely to the stigma, touching R1; the stigma itself is usually yellow but there is a small black spots on the costa at the base of the double costal bristle; on the upper margin there is a single short dark band which runs a little obliquely from R2+3 to the costa, above the radio-median cross-vein; the black patch covers the apical fourth of R1 cell, (thus leaving a fairly large triangular spot in the apical third of this cell) more than the apical half of R3 cell leaving the inferior outer angle hyaline and almost the whole of R5 cell except for two hyaline spots at the base and the entire apex broadly hyaline; the apex of 2nd M2 cell is also hyaline but the dark patch extends over the upper margin for two thirds of the length of this cell and gives rise to 4 narrow bands, 3 of which reach the lower margin and the fourth in 1st M2 cell only reaches M3+Cu1; the first of these bands is the stoutest and shortest, the second intermediate in length between the first and third, towards the middle of 2nd M2 cell and the third is the longest and narrowest, covers the median cross-vein and the extreme tip of M3+Cu1; there is also a small indistinct isolated pale brown spot in Cu1 cell on M3+Cu1; the black patch contains, in addition to the two fairly large and variable hyaline spots at the base of R5 cell, from 1 to 3 smaller hyaline spots, one of which in R3 cell, touching R2+3 is always present, but the other 2, very small, one at the tip of R1 cell and the other in R3 cell immediately below the triangular hyaline spot in R1 cell, are often absent; the outer lateral margin of the dark patch is emarginate and often there is a fifth short, narrow band arising from the lower angle of the patch and extending over the apical part of M1 into 2nd M2 cell; in the upper half of the wing, the inner margin of the dark patch is limited above by the short oblique band in R1 cell and below by a band running on the radio-median cross-vein; all the veins are yellow, but blackish in correspondance with the dark markings.

Squamulae whitish; halteres yellow.

This is the commonest species of this genus in Egypt. I have captured it in all the localities mentioned above for *T. eluta*; I have often observed and obtained it on *Zygophyllum coccineum*, in the desert but have not been able to ascertain yet whether this plant is in any way associated with the life history of this species. In Europe it has been bred from *Picris hieracioides* and from several species of *Lactuca*. *T. amoena* is known from other parts of North Africa, Europe, Madeira and Canary Islands, Persia, Asia Minor and Chinese Turkestan.

More recently I have bred it from the capitulum of *Senecio coronopifolius* and *Picris sprengeriana* from Kerdacé (IV.–V.1924), from *Sonchus oleraceus* (Gizeh 20.V..1924) and from *Centaurea calcitrapa* (Barrage 3.VI.1924).

TRYPANEA STELLATA, Fuessly.
(Pl. V fig. 9)

Fuessly, Verz., 1125. (*Musca*) (1775); Sulzer. Ins., 216. t. XXVIII. f. 12. (*Musca*) (1781); Curtis, Trans. Entom. Soc., II. Bd. III. 43. (*Urellia*) (1823-40); Lw. Germ. Zeitschr., V. 411. 71. t. II. f. 62,63 (*exl. var.* I) (*Trypeta*) (1844) et Trypetid., 119.4. t. XXV. f. 1 (*Urellia*) (1862); Boie. Stettin. Entom. Zeitg., VIII. 328.23. (*Urellia*) (1847); Scholtz, Zeitschr f. Entom. Breslau, 14. (*Urellia*) (1848); Walk., Ins. Brit., II. 204. (*Trypeta*) (1856); Frfld., Sitzungsber. d. Kais. Akad. d. Wiss., XXII. 553. f. 3. (*Urellia*) (1856), Verh. zool.-bot. Ges. Wien. XI. 165. (*Tephritis*) (1861) et XIII. 218. (*id.*) (1863); Schin., Verh. zool.-bot. Ges. Wien, VIII. 681.115. (*Urellia*) (1858) et Faun. Austr., II. 169. (*Tephritis*) (1864); Rond., Dipterol. Ital. Prodr., VII. Ortalid. 28. 1. (*Ditricha*) (1871); Kaltenb., Pflanzenf , 326.14: 339.6; 388.5 et 403.36. (*Trypeta*) (1872): Beck., Annuair. d. Mus. Zool. d. l'Acad. Imp. d. Science d. St. Petersb., XVII. 643.309. (*Trupanea*) (1912).

calcitrapae Rob.-Desv., Myod., 775.1. (*Trypanea*) (1830).

parisiensis Rob.-Desv., Myod., 775.2. (*Trypanea*) (1830).

radiata Fabr., Entom. syst. suppl., 565.157. (*Musca*) (1798) et Syst. Antl., 319.16. (*Tephritis*) (1805); Panz., Faun. Germ., CIII. 21. (*Tephritis*) (1806); Schrank, Faun. Boica, III. 2525. (*Trupanea*) (1803); Meig., Syst. Beschr., V.343.48. t. L. f. 3. (*Trypeta*) (1826); Macq., Suit. à Buff., II.472.11. (*Acinia*) (1835); Walk., p.p., Entom. Mag., III.74. (*excl. fig.* 19.) (*Urellia*) (1836); Zett., Dipt. Scand., VI.2254.51. (*Tephritis*) (1847); Lucas, Explor. scient.

de l'Algérie, III.497.256. (*Acinia*) (1849); WALK., The Entom., No. 92.345.87. (*Urellia*) (1871); KALTENB., Pflanzenf., 335.27. et 341.13 (*Trypeta*) (1872).

terminata FALL., Dipt. Suec. Ortalid., 13.20.(*Tephritis*) (1820); MACQ., Suit. à Buff., II.471.10. (*Tephritis*) (1835); KALTENB., Pflanzenf., 361.18. (*Trypeta*) (1872).

DIAGNOSIS:— Very similar to the preceding species but distinguished from it by its smaller size and by having only 2 dark radiating narrow bands reaching the posterior apical margin of wing.

Male and *Female*. Length of body : 2–3.5 mm.; ovipositor : 0.9 mm.; wing : 2.5–3.3 mm.

DESCRIPTION:— Head entirely pale yellow and covered with a dense white tomentum, except the proboscis, palpi and antennae yellow to brownish-yellow; the *oc.* are very strong in the female but very weak in the male; all the bristles are blackish except the upper *s.or.* the outer *vt*, the *prt.*, the *ocp.* and the genal bristle whitish.

Thorax and abdomen entirely bluish-grey owing to a very delicate pulverulence of that colour and possessing a very pale pubescence; the bristles are brownish-yellow; ovipositor very shining black and about as long as the two apical segments of the abdomen together.

Legs entirely reddish-yellow but the front femora dark reddish-brown except the extreme apex reddish-yellow; front femora with a row of bristles beneath; middle tibiae with a single spur.

Wings with a pattern very similar to the preceding species but distinguished from it by the dark patch from which arise only 2 radiating narrow bands reaching the posterior apical margin; stigma usually with a dark spot near the base, but often is entirely yellow; the triangular spot in R1 cell continues below in R2 cell over R2+3 and often there is a small black spot at the apex of R2 cell, touching the Costa; the two outer narrow bands are the only ones which reach the lower margin and sometimes the first band is reduced and does not even reach the middle of 2nd M2 cell; the third narrow band always ends at the tip of the median cross-vein and never reaches the lower margin; the inner band is also reduced and the radio-median cross-vein is always bordered with dark grey; costal bristle very weak.

Squamulae whitish; halteres reddish-yellow to yellow.

T. stellata is not rare, especially in Upper Egypt. I have captured it in Alexandria, Mariout, Cairo, Kerdacé and Asswan; my

records extend from January 18th to July 27th 1922. The food plant in Egypt is not known so far but in Europe the larva is known to feed in the flower-heads of a great many composite plants, such as *Aster*, *Chrysanthemum*, *Anthemis*, *Hieracium*, *Serratula*, *Inula*, *Senecio* and others.

This species is known from other parts of North Africa, Europe, Asia Minor, Canary Islands and Chinese Turkestan.

TRYPANEA AUGUR, Frauenfeld.
(Pl. V fig. 5 and Pl. I fig. 15 and 23)

Frfld., Sitzungsber. d. Kais. Akad. d. Wiss., XXII. 557. fig. 10. (*Urellia*) (1856); Lw., Berlin, Entom. Zeitg., V.304. t. II. f. 30. (*Urellia*) (1861); Beck., Zeitschr. f. Hymen. u. Dipt., V. 385.415. (*Urellia*) (1907) et Annuair d. Mus. Zool. d. l'Acad. Imp. d. Sc. d. St. Petersb., XVII.644.311. (*Trupanea*) (1912).

DIAGNOSIS:— Distinguished by the 2 *i.or.* and by the 5 dark narrow bands reaching the posterior and apical margins of the wing.

Male and *Female*. Length of body : 4–4.6 mm.; ovipositor : 0.6 mm.; wing : 3.8–4 mm.

DESCRIPTION:— Head entirely pale yellow and covered with a delicate pale yellow tomentum which, on the frons is almost white; all the bristles are blackish to brownish except the upper *s.or.*, the outer *vt.*, the *pvt.* and the *ocp.* whitish; genal bristle strong and accompanied by some white bristly hairs

Thorax, pleurae, scutellum and mesophragma entirely covered with a dense cinereous tomentum and with a very pale yellow pubescence; all the bristles are brownish except the *p.npl.* and the *pt.* pale yellow; the *mpl.* and the latter are accompanied by some yellowish bristly hairs; scutellum with only one pair of *b.sc.*

Abdomen entirely covered with a cinereous tomentum and with a similar pubescence as that of the thorax; ovipositor dark reddish-yellow, shining and as long as the two apical segments of the abdomen together.

Legs entirely reddish-yellow; front femora with a row of bristles beneath; middle tibiae with a single spur.

Wings characterised by the dark patch which is more extensive than in the other three species and which give rise to 5 rays reaching the apical and posterior margins; this dark patch almost entirely covers the stigma and almost the whole of R1, R3 and R5 cells, leaving the bases of these cells hyaline as well as the apices of the two

latter; in R1 cell there is a characteristic elongated hyaline spot on the costa resembling a drop, with its inflated end towards the middle of R1 cell and its narrow end in the middle of the stigma; in R3 cell there are two hyaline spots, the first of which is small and rounded, at the tip of R2+3 on the costa, and the second, at the tip of the cell is much larger, triangular and ending in R5 cell; here the dark patch radiates; the upper or first ray covers the tip of R4+5 (forming the outer margin of the last mentioned triangular spot), the second ray runs obliquely downwards and covers the tip of M1; the third, fourth and fifth rays run almost vertically downwards in 2nd M2 cell, except the fifth ray which covers the undulated median cross-vein; these five rays or dark narrow bands are almost equidistant from each other and they all end at the wing margin; in addition there is one or two short, dark narrow bands in 1st M2 cell, which sometimes only reach M3+Cu1; there is also a rounded hyaline spot in R5 cell near the base, touching M1; costal bristle not strong.

Squamulae whitish; halteres yellow.

Although it is stated above, in the generic description that in this species the proboscis should be "short and geniculate and with the flaps not much prolonged" it is of great interest to record that in a single specimen of the 47 that I have examined the proboscis is of an entirely different type, being strongly geniculate with the apical portion as long as the basal portion (Pl. I, fig. 15) and therefore resembling more the *Tephritis* group to which *T. conyzae* Frfld. belong. In all other characters this specimen is entirely typical.

This handsome species is fairly common all over Egypt; I have captured it in all the localities mentioned above for the three other species and my dates extend from end of January to end of November 1922. I very much suspect the larva to live on *Zygophyllum*, but I am not able yet to state this definitely. *T. augur* has also been recorded from Persia and Algiers by Dr. Th. Becker.

APPENDIX

List of the Egyptian Trypaneidae and their host plants.

Genus : species	Natural Order	Genus : species	Part of plant attacked.
1 Dacus oleae Gmel.	Oleaceae	Olea europaea	Fruit
		» verrucosa, chrysophylla etc.	»
2 Dacus longistylus Wied..	Asclepiadaceae	Calotropis procera	»
3 Dacus semisphaereus Beck.			
4 Dacus annulatus Beck.			
5 Dacus sexmaculatus Walk.			
6 Chaetodacus zonatus Saund.	Rosaceae	Prunus persica	»
7 Carpomyia incompleta Beck.	Rhamnaceae	Zizyphus spina-christi	»
		» jujuba	»
8 Myiopardalis pardalina Big.	Cucurbitaceae	Cucumis Melo	»
9 Ceratitis capitata Wied.	Rutaceae	Citrus aurantium	»
		» nobilis	»
		» japonica	»
		» decumana	»
	Rosaceae	Prunus persica	»
		» armeniaca	»
		» cerasus	»
		Eryobotrya japonica	»
		Pyrus communis	»
		» germanica	»
		» cydonia	»
		» malus	»
		Chrysobalanus ellipticus	»
	Anacardiaceae	Mangifera indica	»
	Solanaceae	Lycopersicum esculentum	»
		Solanum capsicastrum	»
		Atropa belladonna	»
		Capsicum sp.	»
		Cestrum sp.	»
	Rubiaceae	Coffea arabica	»
	Oleaceae	Noronhia emarginata	»
	Cucurbitaceae	Cucurbita sp.	»
	Ebenaceae	Diospyros Kaki	»
	Myrtaceae	Eugenia braziliensis	»
		» jambos	»
		» malaccensis	»
		» uniflora	»
		Psidium guajava	»
		» cattleyanum	»
	Cactaceae	Opuntia tuna	»
		» vulgaris	»

Genus : species	Natural Order	Genus : species	Part of plant attacked
	Moraceae	Ficus carica	»
	Combretaceae	Terminalia catappa	»
	Vitaceae	Vitis vinifera	»
	Apocynaceae	Thevetia neriifolia	»
	Lauraceae	Persea gratissima	»
	Passifloraceae	Passiflora quadrangularis	»
	Rutaceae	Murraya exotica	»
	Sapotaceae	Mimusops elengi	»
		Chrysophyllum cainito	»
		» icaco	»
		Achras sapota	»
	Guttiferae	Mammea americana	»
		Calophyllum inophyllum	»
	Oxalidaceae	Averrhoa carambola	»
	Caricaceae	Carica papaya	»
		» quercifolia	»
	Apocynaceae	Carissa arduina	»
	Flacourtiaceae	Aberia caffra	»
	Anonaceae	Anona muricata	»
	?	Herpephyllum caffrum	»
10 Spheniscomyia debskii Efflat.	Labiatae	Stachys aegyptiaca	Floral buds
11 Spheniscomyia aegyptiaca Efflat.	Labiatae	Lavandula coronopifolia	» »
		Stachys aegyptiaca ?	» »
12 Metaspheniscus gracilipes Lw.			
13 Aciura tibialis R.-D.	Labiatae	Lavandula coronopifolia	» »
14 Myiopites variofasciata Beck.			
15 Urophora macrura Lw. ..	Compositae	Onopordon illyricum	Thalamus (swollen)
		Centaurea calcitrapa	» »
16 Urophora quadrifasciata Meig.	Compositae	Centaurea paniculata	» »
		» jacea	» »
		» pallescens	» »
17 Schistopterum moebiusi Beck.	Compositae	Pluchea dioscoridis	Inflorescence
18 Terellia jaceae R.-D.	Compositae	Centaurea scabiosa	»
		» pallescens	»
		» calcitrapa	»
19 Terellia planiscutellata Beck.	Compositae	Pluchea dioscoridis	»
20 Terellia serratullae L.	Compositae	Carduus defloratus	»
		» acanthoides	»
21 Terellia virens Lw.	Compositae	Centaurea paniculata	»
22 Sphenella marginata Fall.	Compositae	Senecio coronopifolius	»
		Picris sprengeriana	»
		Centaurea sp.	»
		Cineraria sp.	»
23 Ensina sororcula Wied.			
24 Spathulina parceguttata Beck.	Compositae	Ceruana pratensis	»

Genus : species	Natural Order	Genus : species	Part of plant attacked
25 Euaresta iphionae Efflat.	Compositae	Iphiona mucronata	Stem (galls)
26 Tephritis matricariae Lw.	Compositae	Anthemis melampodia	Inflorescence
27 Tephritis spreta Lw.			
28 Tephritis conyzae Frfld.	Compositae	Conyza aegyptiaca ?	»
9 Tephritis lauta Lw.			
30 Tephritis praecox Lw.			
31 Tephritis desertorum n.sp.			
32 Tephritis pulcherrima n.sp.			
33 Tephritis argyrocephala Lw.	Compositae	Solidago virgaurea	Flower-heads
		Aster amellus	»
34 Tephritis tessellata Lw.	Compositae	Taraxacum officinale	»
		Sonchus arvensis	»
35 Trypanea amoena Frfld.	Compositae	Picris hieracioides	»
		» sprengeriana	»
		Sonchus oleraceus	»
		Lactuca virosa	»
		» scariola	»
		» saligna	»
		Centaurea calcitrapa	»
		Asteriscus graveolens	»
	Zygophyllaceae	Zygophyllum coccineum ?	»
36 Trypanea augur Frfld.	Zygophyllaceae	Zygophyllum coccineum ?	»
37 Trypanea eluta Meig.	Compositae	Onopordon illyricum	»
		Silybum marianum	»
		Centaurea paniculata	»
		» jacea	»
		» pallescens	»
38 Trypanea stellata Fuessly	Compositae	Aster tripolium	»
		Matricaria chamomilla	»
		» inodorum	»
		Anthemis cotula	»
		» arvensis	»
		» cinerea	»
		» melampodia	»
		Hieracium sabaudum	»
		Serratula tinctoria	»
		Inula britannica	»
		Picridium vulgare	»
		Senecio paludosus	»
		» jacobaea	»

INDEX

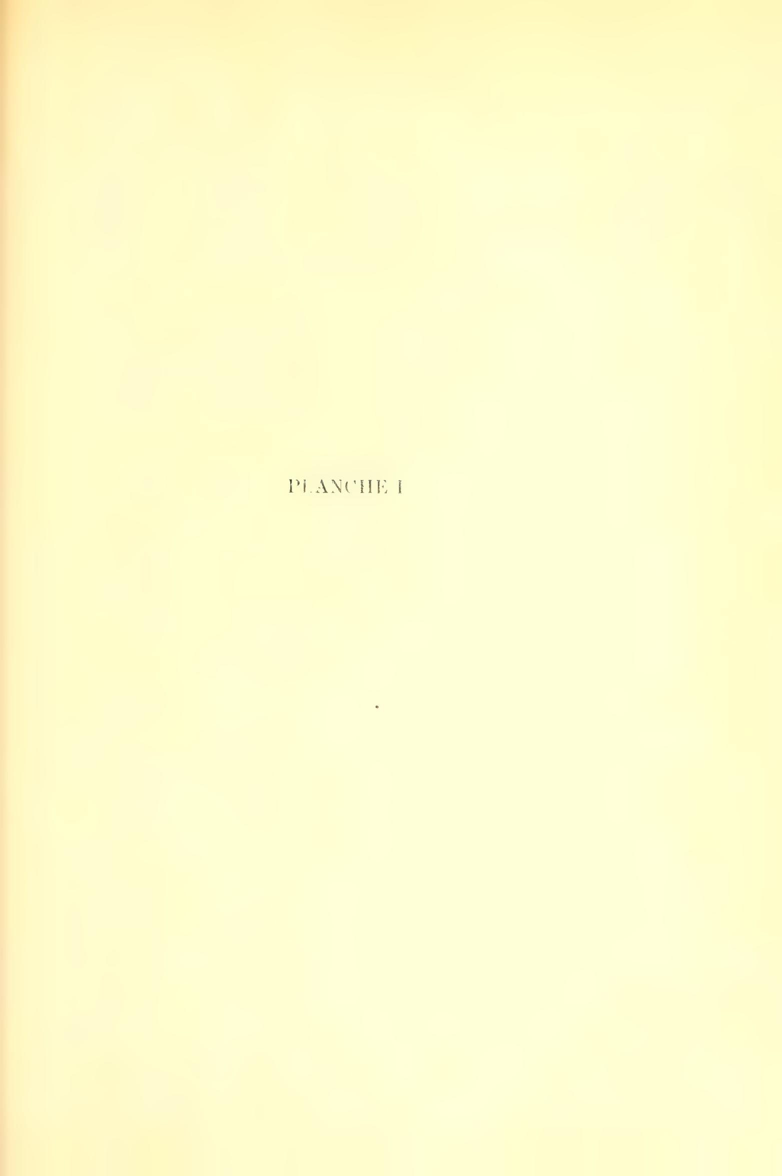

PLANCHE I

EXPLANATION OF PLATE I.

Fig. 1	*Euaresta iphionae* Efflat.,	head, front view
2	*Schistopterum mœbiusi* Beck.,	» » »
3	*Myiopardalis pardalina* Big.,	» » »
4	*Urophora macrura* Lw.,	» » »
5	*Myopites variofasciata* Beck.,	» » »
6	*Dacus longistylus* Wied.,	» » »
7	*Myopites variofasciata* Beck.,	» side »
8	*Sphenella marginata* Fall.,	» front »
9	*Dacus longistylus* Wied.,	» side »
10	*Schistopterum mœbiusi* Beck.,	» » »
11	*Tephritis lauta* Lw.,	» » »
12	*Sphenella marginata* Fall.,	» » »
13	*Ensina sororcula* Wied.,	» » »
14	*Tephritis conyzae* Frfld.,	» » »
15	*Trypanea augur* Frfld.,	» (showing abnormal proboscis)
16	*Urophora macrura* Lw.,	head, side view
17	*Terellia serratulae* Linn.,	» » »
18	*Aciura tibialis* Rond.,	» » »
19	*Terellia virens* Lw.,	» » »
20	*Carpomyia incompleta* Beck.,	» » »
21	*Euaresta iphionae* Efflat.,	» » »
22	*Chaetodacus zonatus* Saund.,	» » »
23	*Trypanea augur* Frfld.,	» » » (normal)
24	*Myiopardalis pardalina* Big.,	» » »
25	*Tephritis argyrocephala* Lw.	» » »

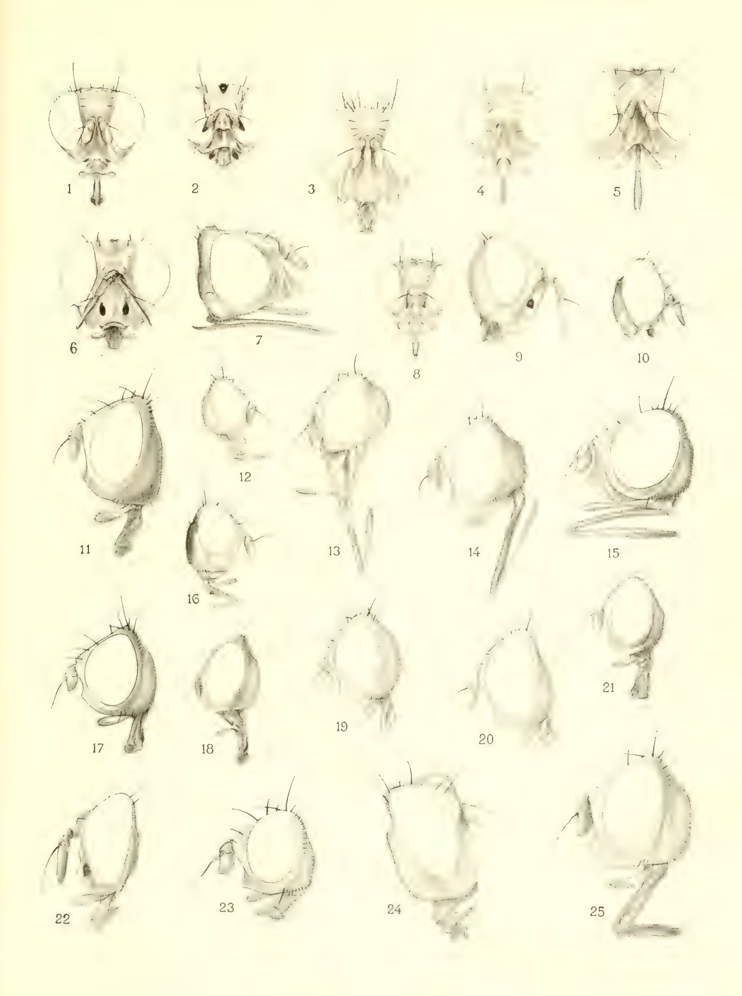

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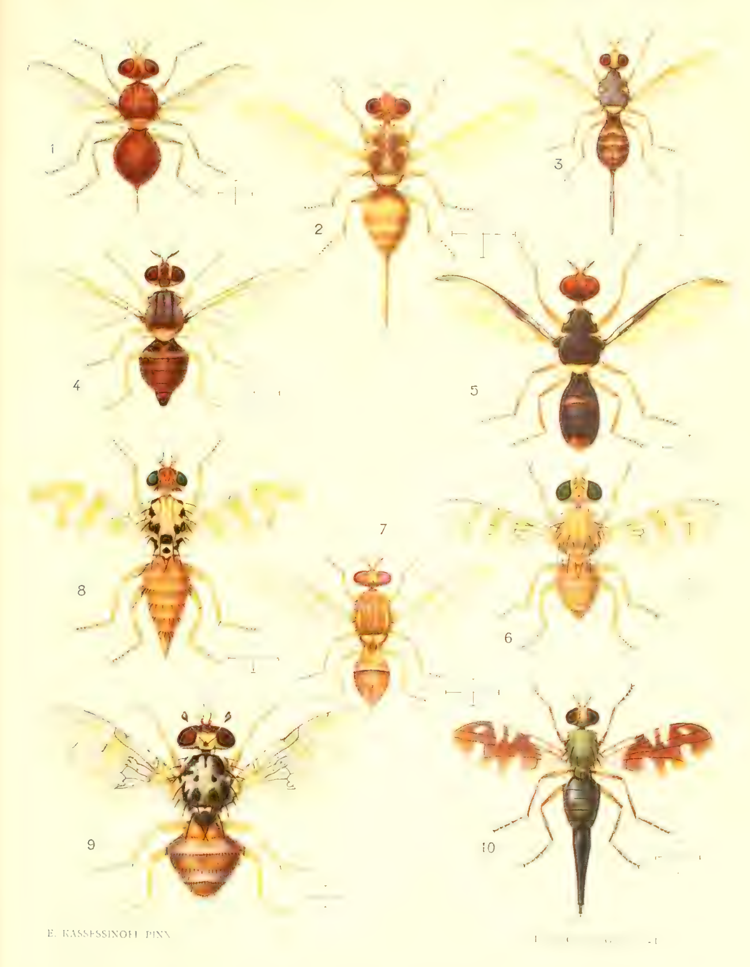
PLANCHE II

EXPLANATION OF PLATE II.

Fig. 1 *Dacus semisphaereus* Beck., ♀
" 2 *Dacus longistylus* Wied. var. nov. *clarus*, ♀
" 3 *Dacus longistylus* Wied., ♀ (type)
" 4 *Dacus oleae* Gmel., ♀
" 5 *Dacus annulatus* Beck., ♂
" 6 *Carpomyia incompleta* Beck., ♀
" 7 *Chaetodacus zonatus* Saund., ♂
" 8 *Myiopardalis pardalina* Big., ♀
" 9 *Ceratitis capitata* Wied., ♂
" 10 *Metasphenisc us gracilipes* Lw., ♀



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DACUS, CHAETODACUS, CARPOMYIA, MYIOPARDALIS, CERATITIS, METASPHENISCUS

PLANCHE III

EXPLANATION OF PLATE III.

Fig. 1 *Urophora macrura* Lw., ♀

2 *Spheniscomyia aegyptiaca* Efflat., ♀

3 *Terellia serratulae* Linn., ♂

4 *Terellia planiscutellata* Beck., ♀

5 *Schistopterum mœbiusi* Beck., ♀

6 *Terellia jaceae* Rob.-Desv., ♀

7 *Terellia virens* Lw., ♀

8 *Urophora quadrifasciata* Meig., ♀

9 *Spheniscomyia debskii* Efflat., ♀

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SPHENISCOMYIA, UROPHORA, TERELLIA, SCHISTOPTERUM

PLANCHE IV

EXPLANATION OF PLATE IV.

Fig. 1 *Tephritis spreta* Lw., ♀

2 *Tephritis argyrocephala* Lw., ♀

3 *Sphenella marginata* Fall., ♀

4 *Tephritis matricariae* Lw., ♀

5 *Spathulina parceguttata* Beck., ♀

6 *Ensina sororcula* Wied., ♀

7 *Myopites variofasciata* Beck., ♂

8 *Aciura tibialis* Rond., ♀

9 *Tephritis pulcherrima* nov. spec. ♀

E. KASSESSINOFF PINX. PHOTO-CHROMO GRAVURE.

SPHENELLA, SPATHULINA, ENSINA,
MYOPITES, ACIURA, TEPHRITIS

PLANCHE V

EXPLANATION OF PLATE V.

Fig. 1 *Tephritis praecox* Lw., ♀

2 *Trypanea eluta* Meig., ♀

3 *Tephritis desertorum* nov. spec., ♀

4 *Tephritis conyzae* Frfld., ♀

5 *Trypanea augur* Frfld., ♀

6 *Trypanea amœna* Frfld., ♀

7 *Tephritis lauta* Lw., ♀

8 *Euaresta iphionae* Efflat., ♀

9 *Trypanea stellata* Fuessly, ♂

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